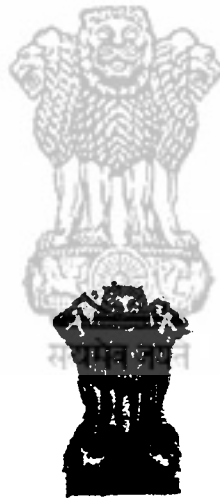


GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE

CO-ORDINATION OF AGRICULTURAL STATISTICS IN INDIA



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September, 1949

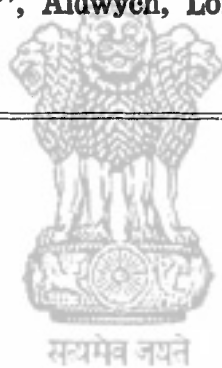
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CO-ORDINATION OF AGRICULTURAL STATISTICS IN INDIA

REPORT OF THE TECHNICAL COMMITTEE

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September, 1949

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INTRODUCTION

0.1. Draft Proposal from the F.A.O.—A draft proposal for conducting a world census of agriculture in the year 1950 on the basis of a minimum programme was forwarded by the Food and Agricultural Organization in February 1947 to H. M., External Affairs and referred by him to H. M., Agriculture. This document was subsequently reviewed by the F.A.O. Standing Advisory Committee on Statistics and the revised programme for the 1950 census (*vide* Appendix III) was presented to the Governments in December 1948.

0.2. Scope of the Agricultural Census.—The proposed census of agriculture is in principle conceived of as a complete and direct enumeration of all types of agricultural holdings; yet, the adoption of other means of obtaining the information wherever preferable or necessary is not ruled out. In this census it is intended that each Government should obtain accurate and comparable information on the following items:—

- (a) the number of agricultural holdings and their principal characteristics such as size, form of tenure, utilization of the area, utilization of labour, implements and mechanical power etc.;
- (b) the number and characteristics of the people who secure their livelihood from agriculture;
- (c) areas under crops and numbers of livestock; and
- (d) the volume of production of all important agricultural products.

The short list of items on which data is desired from all countries by the F.A.O. covers: (I) Holder and Tenure, (II) Land Utilization, (III) Agricultural Population, (IV) Crops, (V) Power, and (VI) Livestock and Poultry. The F.A.O. propose that the crop data to be gathered during the 1950 census should refer to crops harvested in the calendar year 1949 for the Northern Hemisphere and for the Southern Hemisphere to those harvested in the year from 1st July 1949 to 30th June 1950. Further, where, in any country, for unavoidable reasons, it is necessary to collect data relating to another year, the chosen year should be as near as possible to the one that is proposed.

0.3. Proposals considered by the Ministers' Conference.—The question of India's participation in the world census of agriculture was considered by the Conference of the Provincial and State Ministers of Agriculture held in September 1948. This Conference recommended that the Government of India should co-operate with the F.A.O. in organizing the agricultural census, and that the occasion of this census should be made use of for collecting all the basic data in the field of agriculture without restricting the scope of the enquiry to the minimum list of items presented by the F.A.O. The objective should be to place the agricultural statistics of the country on a sound basis as a permanent measure, and the various enquiries should be so planned as to provide, in a comprehensive manner all the data that is required for formulating measures of agricultural development. As it was not feasible to hold the census in 1949-50 in view of the very short time left for the technical planning of the census, and the setting up of the necessary administrative machinery, the Conference recommended that the agricultural census in India should be postponed to the year 1950-51.

0.4. Appointment of the F.A.O. Census Committee.—This Conference also recommended that a Committee should be appointed consisting of representatives of the Central, Provincial and State Governments, at technical level, to work out the details of the different enquiries, annual and periodical to be organized in connection with the census of agriculture. In accordance with this recommendation, the Government of India constituted the F.A.O. Census Committee (*vide* Ministry of Agriculture, letter No.F.12-7/48-Est. dated the 6th April 1949 Appendix XII).

0.5. Terms of Reference.—The terms of reference of this Committee were:

- (a) to examine the forms of returns at present used by the different provinces and states for routine collection of data and to evolve standard forms of returns;
- (b) to consider whether any special modifications are necessary in the scope of the enquiry in respect of areas where the system of land survey or record of rights is not introduced; and
- (c) to explore the directions in which the data collected through the census of agriculture can be usefully integrated with the data collected through the census of population.

0.6. Meetings.—The Committee held two sittings, one from the 25th to 27th April 1949 and another from 1st to 5th September 1949. In the first meeting, the Committee discussed the relationship between the population and agricultural censuses and the general lines on which the improvements of agricultural statistics should be organized. At the second meeting the draft report was considered.

Professor Mahalanobis was not able to attend both the meetings due to his absence away from India and was represented by Mr. N. T. Mathew. Mr. K. S. Sursinhji, representative of the Saurashtra Government, could not attend the first meeting and on his subsequent retirement from service, no substitute was appointed by the Government of Saurashtra. Mr. N. C. Chakravarti could not attend either of the meetings. Mr. B. A. Bambawale could not attend the first meeting but was represented by Mr. P. H. Abhyankar. Mr. S. M. Seth, who subsequently replaced Mr. B. A. Bambawale as the representative of C. P. and Berar from the 15th June 1949 attended the second meeting. Dr. B. Natarajan could not attend the second meeting of the Committee.

0.7. Secretary's Tour.—The Secretary visited the provinces and states not represented on the Committee and held discussions with the local Governments regarding the standard forms of returns proposed for the collection of agricultural statistics and the general lines of organizing the agricultural census in the different provinces and states.

0.8. Acknowledgements.—We wish to acknowledge our indebtedness to Mr. M. W. M. Yeatts, Census Commissioner to the Government of India who kindly accepted our invitation to meet us at our first meeting and gave us the benefit of his advice. We also wish to place on record the valuable assistance and co-operation given to our Secretary, during his tour, by the officers of the Provincial and State Governments.

We wish to place on record our high appreciation of the services rendered to us by our Secretary, Mr. J. S. Sarma. Mr Sarma has made a careful study of the position of agricultural statistics in different parts of the country, after patiently going through the various relevant documents as well as personally visiting the provinces and states. He greatly lightened our task by preparing detailed notes on the different items falling within

our terms of reference and putting up a draft report for our approval. The detailed and well thought out preliminary arrangements made by him greatly facilitated our work and enabled us to reach unanimous conclusions after only two meetings. The staff under him also put in long hours of work in order to finish the work within the scheduled time.



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CHAPTER I

PRESENT POSITION REGARDING THE AVAILABILITY OF AGRICULTURAL STATISTICS

1.1. *Availability of Agricultural Statistics.*—Out of the total geographical area of 781 million acres of the Indian Union, all the provinces and about eighty former Indian states, comprising about 654 million acres of area report agricultural statistics. Complete figures are not reported even for these areas since there are large tracts of unsurveyed areas and other lands held under privileged tenures within some of these states for which no data is available. Thus, the present coverage of the agricultural statistics is about 557 million acres, no data being available for the remaining 29 per cent. of the geographical area of the country. The principal publications giving the agricultural statistics of the country are the two volumes of "Agricultural Statistics of India" (Vols. I and II) dealing with Indian provinces and states respectively and the "Estimates of Area and Yield of Principal Crops in India". The detailed position regarding the availability of statistics of acreage, yield of principal crops, numbers of livestock and other statistics in the field of agricultural economics is described below.

Acreage Statistics

1.2. *Reliability of Statistics of Acreage.*—With respect to the statistics of acreage, even the available data is not of the same uniform standard of accuracy and reliability in the different provinces and states. This is mainly due to the differences in the methods of its collection, which depend on the systems of land revenue settlement in the different provinces. Broadly, the provinces can be divided into two classes, *viz.*, the temporarily settled provinces and the permanently settled provinces, based on the modes of revenue assessment and collection. This distinction, however, is not a clear-cut one, for in the U. P., Madras and Assam, which are temporarily settled, there are areas which have been permanently settled, while in Bihar, Orissa and West Bengal which are permanently settled provinces, there are areas which have been temporarily settled. In the temporarily settled provinces, there exists a village revenue agency which maintains agricultural statistics as part of land records. The statistics of area under crops which are based on periodical field-to-field inspection of crops, are fairly accurate in these provinces. In the latter, *viz.*, the permanently settled provinces, where no such revenue agency exists, the figures are furnished by the police chaukidars who base their estimates on their impression of the crop in any particular year, in relation to the normal crop. The acreage figures in these latter areas are naturally not as reliable as in the former. The reporting states fall into one or the other of the above two classes of provinces.

1.3. *Estimates for Unsurveyed Areas in Temporarily Settled Provinces.*—Although most of the geographical area of the temporarily settled provinces is cadastrally surveyed, there are some portions which are not surveyed in such great detail, *i.e.*, for which the individual field boundaries are not surveyed and mapped. Since no field-to-field inspection is possible in these areas in the absence of a cadastral survey, the estimates of acreage under crops supplied by the revenue agency are only approximate. However, as the reporting agency is trained and is in touch with the

cultivators and the crop-conditions, the estimates furnished by these officers are slightly more reliable than the figures reported by the chaukidars in the permanently settled provinces. But they cannot be considered as of the same degree of accuracy as those in the cadastrally surveyed areas.

1.4. *Different Types of Surveys*.—But in a majority of the unsurveyed areas no reporting agency exists at all and hence no agricultural statistics are reported. The total geographical area of these unsurveyed tracts in the reporting and non-reporting areas is 267 million acres in the aggregate, forming 34 per cent. of the geographical area of the country. In order to understand the problems of these unsurveyed areas, the different types of surveys that are now carried out by the various departmental agencies, provincial or central may be mentioned briefly.

- (i) *Topographical Survey*.—Firstly, the Survey of India Department (Government of India) carries out a detailed topographical survey of the land and prepares topographical maps varying in scale ($\frac{1}{4}$ to 1 inch to a mile). These maps are available in the office of the Surveyor General of India as well as with the Provincial Governments. These topographical surveys are carried out in different areas at different times, and hence all the maps do not relate to the same period. Of the total area of the Indian Union, about 15 per cent. is either unsurveyed or surveyed prior to 1905. These unsurveyed areas comprise mostly of the Indian states forming parts of Vindhya Pradesh, Saurashtra, Himachal Pradesh and Rajasthan.

The topographical surveys do not give the details of the village boundaries; and the smallest administrative unit demarcated on the map is the tehsil or the taluka, the tehsil boundary shown corresponding to the date of the survey. Relation between the map and the ground can be established by the identification of items of topographical detail.

The topographical survey is not always carried out by entirely ground survey methods. The method of surveying from air photographs is now extensively used and is being adopted for an intensive survey of areas covered by new Irrigation Projects.

- (ii) *Cadastral Survey*.—Secondly, there is the cadastral survey which is a large scale survey and which is carried out by the respective Provincial Governments under the auspices of their Survey and Settlement Departments. In this survey each separate division of land actually demarcated on the surface is given a survey number and its boundaries are shown in the field-map. These maps are maintained in each village with the patwari and are kept up-to-date. The references to the unsurveyed lands hereafter made in this Report relate to lands not cadastrally surveyed.

- (iii) *Goal Survey*.—Thirdly, there is what is known as a goal survey which is done in some of the Inam villages of Mysore and which lies half way between the topographical survey and the cadastral survey. In this survey the boundary of each village is demarcated; but within the village only four or five blocks of land into which the land is divided are shown, giving perhaps the village site or the cultivated block or the forest area, as at the time of survey.

1.5. *Topography of Unsurveyed Areas*.—The topography of these unsurveyed areas is also different in different places. Most of these areas

are covered by hills or inaccessible forests and this is mostly the reason why these areas have not been surveyed. In the plains, if no survey has so far been carried out, it is because the system of tenure under which the lands are held and the methods of revenue assessment did not require any detailed settlement and survey operations. As long as the Provincial Governments got their share of the revenue, from the Zamindars or the Landlords for the area held by them under the permanent settlement, they had no special incentive to undertake a detailed settlement survey.

1.6. *Country divided into Three Categories.*—Thus the country can be divided into three categories with respect to the availability and the reliability of the statistics of acreage, as in the following table:

Table showing the availability of statistics of acreage in India

(In million acres)

		Reporting		Non-reporting	Total
		Based on complete enumeration	Estimated		
Temporarily settled provinces.	Surveyed	232	..	..	232
	Unsurveyed	..	87	..	87
	Total	232	87	..	319
Permanently settled provinces.	Surveyed	..	73	..	73
	Unsurveyed	..	10	..	10
	Total	..	83	..	83
Indian States	Surveyed	145	5	49	199
	Unsurveyed	..	5	175 (a)	180
	Total	145	10	224	379
Grand Total		377	180	224	781 (b)

NOTE.—A detailed table for individual provinces, states and states unions is given in Appendix IV on the basis of available information.

(a) Obtained by subtraction from the total area.

(b) As given in Census of India Paper No. 2.

Temporarily Settled Provinces

1.7. *Method of collecting Agricultural Statistics.*—In the temporarily settled provinces, the village revenue agency maintains regular agricultural statistics as part of land records, since the assessment of revenue is based on the land-use and the crops grown in each season. The revenue agency consists of village officials called patwaris, one in charge of every village or a group of villages, who collect the primary data on the basis of a field-to-field inspection of crops at periodic intervals. After each crop inspection, the patwari is required to submit consolidated statements showing the areas under different crops, etc., in each season, to the superior officer, in standard forms prescribed for the purpose. The superior officer called kanungo, or revenue inspector, in charge of one revenue circle, consisting of about 100 villages, controls and supervises the work of patwaris. The work of collection and compilation of agricultural statistics is further supervised and controlled at successive stages by the tehsil and the district officers of the revenue department. In the areas where all the fields have been cadastrally surveyed and mapped, the geographical area of each survey number and sub-number is accurately known and thus the acreage under the crop for a given region is determined accurately. If, however, the whole field is not under the same crop or if there are uncultivated patches in the field for which only the total geographical area is known, the area under the crop is generally estimated approximately by the patwari.

1.8. *Detailed position in Temporarily Settled Provinces.*—There is however considerable variation in respect of the jurisdiction of each patwari, the number of crop-inspections done, and the extent of surveyed and unsurveyed areas in the different temporarily settled provinces. These details are given below for each of the temporarily settled provinces of Assam, Bombay, C. P. and Berar, East Punjab, Madras, United Provinces and the centrally administered areas of Ajmer-Merwara, Coorg and Delhi.

(a) *Assam.*—The area of Assam may be divided into three categories. Firstly, in the plains of the temporarily settled districts, the village mandals (one in charge of about ten villages) furnish the estimates of area based on field-to-field inspection. Secondly, there are certain areas comprising the hilly districts of Assam and the hilly portions of the plains districts, covering about 20 million acres, which are temporarily settled but where the revenue assessment is based on the household, instead of on the land. With respect to these areas, the revenue agencies are not required to maintain any land records. Lastly, there are the areas covered by the permanently settled plains portions of Golpara district which are neither cadastrally surveyed nor have any revenue agency. The estimates of acreages under the forecast crops for the last two categories of areas are at present based on the figures furnished by the district officers in charge of the respective areas. For non-forecast crops, only quinquennial estimates are furnished by the Deputy Commissioners. In the permanently settled areas, the assistance of the Zamindars and other intelligent headmen is taken in framing the estimates of area in any particular season.

Thus the basis of agricultural statistics in three-fourths of the area of Assam is largely conjectural.

(b) *Bombay.*—The reporting agency in Bombay consists of about 5,400 talathis (one in charge of three to four villages) and revenue inspectors. The harvest inspection of the kharif and

the rabi crops is usually done twice a year, i.e., in September to October and December to January or January to February respectively. The whole area is surveyed but for some Inam and alienated villages for which approximate estimates are furnished by the revenue agencies existing in those areas. In making the estimates for the unsurveyed villages, the ordinary distribution of crops in the neighbouring government villages is borne in mind, as well as the opinions of leading men or patels of the villages.

- (c) *U. P. and Berar*.—Although the whole area of C. P. and Berar is temporarily settled, the systems of land revenue followed and hence the land records maintained in the Central Provinces and in Berar differ in many details. The patwari agency exists throughout the province and on an average there is one patwari in charge of 7 villages in the C. P. and 3 villages in Berar. The work of these patwaris is supervised by the revenue inspectors in charge of the respective circles. The annual harvest inspection starts in the middle of October and is completed by December.
- (d) *East Punjab*.—The agricultural statistics in the East Punjab are collected by the patwaris (numbering about 4,500), one in charge of 4 villages on an average. About 3.9 million acres comprising of mountainous tracts of Simla and Kangra districts and of river bed in Gurgaon district is unsurveyed. But the rest of the province is surveyed and the statistics are based on field-to-field inspection of crops. There are two principal crop inspections, the Rabi *girdawari* (harvest inspection) starting on the first of March and the Kharif *girdawari* on the first of August.
- (e) *Madras*.—About two-thirds of the cultivated area of the province is under the Raiyatwari system of tenure and has been carefully surveyed. The village officers called karanams (one in each village) furnish the revenue inspectors, by the 25th of each month with a detailed cultivation statement showing the sowings of crops and outturn of harvested crops for each village on the basis of a monthly field-to-field inspection. Similar revenue agencies exist in the remaining one-third of the cultivated area also which is whole Inam or Zamindari, but since most of these areas are not surveyed, the acreage statistics furnished for the unsurveyed areas of the Inam villages are not based on field-to-field inspection, and are consequently largely conjectural.
- (f) *U. P.*—The reporting agency in the United Provinces consists of about 27,000 patwaris, one in charge of about 4 villages and about 700 kanungos, who furnish the estimates of acreage statistics on the basis of field-to-field inspection carried out during the three principal crop seasons of Kharif, Rabi and Zaid in the temporarily settled as well as in the permanently settled portions of the province. The whole area is surveyed, but for the hilly portions of Naini Tal, and hill districts of Almora and Garhwal for which the required particulars are not available. Since 1938-39 however, conventional estimates for these areas are included in the provincial returns of agricultural statistics.

- (g) *Ajmer-Merwara*.—The estimates of area in Ajmer-Merwara in the Khalsa, Jagir and minor Istimrari villages are based on the field-to-field inspection made by the patwari at each of the two principal harvest inspections done in the autumn and spring respectively. The kanungo supervises the work of patwaris in these areas. In the large Istimrari estates, the preparation of the field books is done by the estate officials and the government agency does not supervise the collection of figures in these areas. As such, the estimates of area under certain crops in respect of these areas are conjectural.
- (h) *Coorg*.—Coorg is a temporarily settled area where the shanbogs (patwaris) maintain the agricultural statistics as in the other temporarily settled provinces. The shanbog is not only a revenue accountant but also a surveyor and has, on the average, eight to ten villages under his jurisdiction. The work is supervised by the parpattigars (kanungos) and subedars (tehsildars). About one-third of the area of Coorg is under reserve forest, worked by the Forest Department and the Revenue Department has no control over this area.
- (i) *Delhi*.—The method of reporting agricultural statistics in Delhi corresponds to that in the East Punjab. The reporting agency consists of 87 patwaris and 5 kanungos the jurisdiction of each kanungo and patwari extending to about 4 and 70 villages respectively.

Permanently Settled Provinces

1.9. *Position in the Permanently Settled Provinces*.—In the permanently settled provinces there is no elaborate agency for the collection of agricultural statistics. Firstly, the system of revenue collection does not require the maintenance of agricultural statistics, and secondly, there are no revenue officers in the villages who can be entrusted with this work. Hence, till recently, the estimates of area under crops reported for these regions are of the nature of guess work, being furnished by the village officials (*i.e.*, chaukidars) belonging to the police department who are not trained in the crop-reporting work and who are generally illiterate. There is also no adequate supervision over the work of this primary agency. In these areas, a sub-division or circle officer is required to ascertain the relation which the area under the crop in each season bears to the normal acreage under that crop. The normal acreages under the different crops are generally based on the data collected during the settlement years. The estimates of acreage are based on the data furnished by the chaukidar agency and are compiled and consolidated at successive stages by the sub-divisional and district officers. The Provincial Governments base the final estimates of area on the figures supplied by the district officers. Since no objective method is followed anywhere in the process, the final estimates of area are not satisfactory.

1.10. *Detailed Position in the Permanently Settled Provinces*.—Recently, however, the attention of the Provincial Governments has been drawn by the Government of India to the need for improving the reliability of the agricultural statistics. Various schemes for improvement of agricultural statistics have been prepared and implemented by the Provincial Governments. The present position in the three major permanently settled provinces of West Bengal, Bihar and Orissa is described below:—

- (a) *West Bengal*.—(i) In the absence of a village revenue agency which is necessary for the adoption of the method of complete enumeration for acreage statistics, the feasibility of employing

the random sampling technique for estimating the area under the principal crops has been investigated by the Indian Statistical Institute. Preliminary investigation on this question started with a study of the possibility of the estimation of area under jute in Bengal by the sampling method in the year 1937. This method was extended to the entire province for jute in 1941, and later, for a few other crops including paddy. The official estimates of acreage under paddy are now based on this method.

The plan of survey consists in dividing the province into a number of zones either with administrative sub-divisions, *viz.*, thanas or with convenient geographical sub-divisions of specified area, as strata. From each zone, a number of sample units are selected at random, each sample unit consisting of a square grid generally 2.25 acres in area; the size of the sample unit and the intensity of sampling however vary from zone to zone. The whole sample is divided into two sub-samples and the grids belonging to these two inter-penetrating sub-samples are then enumerated by different groups of investigators who actually visit the individual plots located in the grid and record the proportion of land under different crops, etc.

(ii) The existing official method of obtaining the data from the district officers is also continued. However, in order to systematise the collection of crop forecast data from the district officers, the Director of Agriculture, West Bengal, has recently circulated standard forms in which the forecast data and other agricultural statistics are to be furnished.

(iii) In addition to this, the newly appointed union agricultural assistants are entrusted with the work of crop reporting also. They are required to compile estimates of areas under crops by a method analogous to the complete enumeration method. In the case of paddy and jute which are the predominant crops, the agricultural assistant is expected to consult the "Khasra" prepared during the 1944-45 complete enumeration survey* and base his estimates for the year on the changes that have occurred during the current year. This Khasra for land and crops shows in respect of each plot number, the area of the plot and the use to which the land is put. The complete enumeration of area under other crops is not expected to give much difficulty, since the number of such plots is small in each season.

The Director of Agriculture finalises the figures for the province taking into account the different sets of figures furnished by the district officers, union agricultural assistants and the Indian Statistical Institute.

(b) *Bihar*.—(i) The method of random sampling for the estimation of acreage under principal crops has been tried in Bihar during the bhadoi (autumn) and aghani (winter) crops of 1944 and the rabi crops of 1944-45. This method has however been discontinued subsequently.

(ii) Under the scheme for the improvement of agricultural statistics, complete enumeration surveys are being carried out in Bihar

* "Agricultural Statistics by plot-to-plot Enumeration in Bengal 1944-45" Published by the Government of Bengal.

with the help of specially appointed field staff of amins from the year 1944-45. The enumeration proper consists in visiting each field, identifying it with the help of the Field Map and relevant records and noting down the extent of crops grown on the fields. For this purpose the amin has to visit each village three or four times a year for recording the areas and outturn of crops during the principal sowing and harvesting seasons of the year. The data collected during these surveys has not hitherto been utilized for official statistics. It is however proposed to adopt these statistics from the current year. The whole area of Bihar is cadastrally surveyed, and field maps exist for all but a few hundred square miles of area covered with forests.

The Government of Bihar have decided to utilize the agency of amins for the work in connection with the Zamindari abolition, and have consequently increased the total staff to 5,000 and designated them as "kramcharis". Thus each kramchhari has now about 10 to 12 villages in his jurisdiction.

(c) *Orissa*.—In Orissa, a similar scheme for the improvement of agricultural statistics by field-to-field enumeration is being conducted for the last five years all over the province except the surveyed portions of the Ganjam district where a regular patwari agency exists for reporting the statistics. In the Orissa survey, only the area under cultivation is enumerated, no account being kept of the detailed classification of uncultivated land. Even in the beginning, the amins who were expected to do this enumeration had a large jurisdiction and since the beginning of this year, consequent upon a reduction in the number of amins employed under the scheme, the charge of each amin has been doubled. The revised method of enumeration now employed, prescribes that the amin should visit half the number of villages and enumerate all the fields completely and for the other half, the amin should report only the changes in the cultivated area from the previous year. This method cannot give reliable figures.

In the unsurveyed areas of Koraput and Ganjam the cultivated blocks are enumerated by measuring the approximate dimensions of the separate blocks.

1.11. *Improved Methods not Firmly established*.—Thus, schemes for the improvement of agricultural statistics have been initiated in the permanently settled provinces as early as 1943-44, but these improved methods have not yet been firmly established in these provinces.

INDIAN STATES

1.12. *Reporting States*.—While all the provinces report both statistics of area and yield for the principal crops, the same is not true in the case of the states. Thus there are certain reporting states which furnish annual returns of agricultural statistics but do not report area and yield of crops for crop forecasts; while there are a few others which do not supply annual returns of agricultural statistics, but which furnish periodical estimates of area and yield of all or some principal crops.

1.13. *Detailed Position in Indian States*.—The problem of collecting agricultural statistics has hitherto been complicated by the existence

of a large number of tiny states with no close-knit and organised revenue administrations, but the position is expected to improve considerably after the recent constitutional changes involving the merger of these states with the neighbouring provinces, or into viable unions. The present position may be studied separately in respect of (a) states merged with provinces, (b) states forming unions or centrally administered areas and (c) other individual states.

(a) *States merged with provinces.*—The total geographical area of the states merged with the provinces of Orissa, Bihar, C.P. and Berar, Bombay, Madras and East Punjab is of the order of 67 million acres.

(i) In the states which have merged with Orissa there does not exist any village revenue agency, but most of the areas are reported to be *cadastrally* surveyed.

(ii) In the states merged with Bihar, suitable steps are being taken by the Provincial Government to establish the agency of *kramcharis* as in the remaining portions of the province.

(iii) In Bombay and C. P. and Berar, similarly, the *patwari* agency is being established in the merged states also and the necessary land records will be maintained as in the rest of the province.

(iv) The prevailing system of tenure in Sandur and Pudukkottai which have merged with Madras is the *raiayatwari* system. There are however some unsurveyed areas in these states also for which no returns of agricultural statistics exist.

(v) For the other states which have merged into different provinces, no information is available.

(b) *States merged into unions.*—The total area of the states which have merged into unions is about 173 million acres. The areas in which primary reporting agencies are known to exist are as follows.

(i) In the Khalsa areas of states which have merged into Greater Rajasthan, the *patwari* agency exists and the agricultural statistics are based on the information collected by the *patwari* during the three harvest inspections.

(ii) Similarly, in the major states of Madhya Bharat such as Gwalior and Indore, the *patwaris* in the Khalsa villages furnish the agricultural statistics based on a field-to-field inspection of the crops.

(iii) The whole of the Patiala and East Punjab States Union is temporarily settled and surveyed. The *patwari* agency although the method of maintaining the revenue records is not uniform in all the constituent states. The PEPSU Government are considering proposals to standardize the procedures in all the areas on the lines of the Patiala State.

(iv) In the Himachal Pradesh, the revenue agency exists only in 3,000 sq. miles out of the total geographical area of 10,000 sq. miles. The remaining 7,000 sq. miles is covered with hills and forests and is not *cadastrally* surveyed and as such no data is available in respect of these areas

(v) In the United States of Travancore and Cochin, the position in Travancore is different from that in Cochin. In Travancore, the existing system of land revenue is similar to that

of the permanent settlement according to which basic tax of annas 14 per acre is levied on all land irrespective of the crops grown thereon. Thus the revenue officers are not required to maintain elaborate statistics in this state. In Cochin, the village records are maintained by the par-pattigars (patwaris) as in the temporarily settled provinces. The data on agricultural statistics are collected on the basis of field-to-field crop inspection. Both Travancore and Cochin furnish only the returns for agricultural statistics, but not for crop forecasts.

Saurashtra Union does not report any agricultural statistics except in respect of one state. Detailed information regarding Vindhya Pradesh is not available.

(c) *Other States.*—The total area of these other states, which have not so far merged is of the order of 139 million acres, and in a greater portion of this area, there exist some sort of reporting agencies. The most important states in this group are Hyderabad, Jammu and Kashmir and Mysore. The position with respect to these is as follows:

- (i) In Hyderabad, about 40 per cent. of the area was held under jagirs and other privileged tenures which did not fall within the jurisdiction of the governmental revenue agency till recently. The jagirdari system has since been abolished. The raiyatwari system of tenure prevails throughout the state, and with the exception of a few former jagirs, the whole area is surveyed and settled. Patwaris exist in the whole state, including most of the jagir areas also. These patwaris do not receive a monthly salary but get a share in the amount of revenue collected, on a commission basis.

In addition, an annual agricultural census is taken throughout the state with the help of honorary enumerators selected from all classes of population, as in the case of the population census. Paid agricultural inspectors are appointed in each tehsil to collect the statistics from these enumerators under the supervision of district officers. The primary enumerator is required to visit each village and obtain the necessary particulars of area and other details of agricultural statistics from the patwari's record, satisfy himself about their accuracy and furnish the data to the agricultural inspectors, in standard forms prescribed for the purpose.

- (ii) In Kashmir, agricultural statistics are reported for about 15 per cent. of the area of the state. For the remaining area, no information is available.

- (iii) In Mysore, agricultural statistics are based on the entries made by the shanbog (village accountant) in his crop inspection book. The whole area is surveyed except about 1,600 Inam villages, for which no cadastral maps are available. The revenue agency in these areas furnishes approximate estimates of areas under crops.

STATISTICS OF CROP YIELDS

1.14. *Statistics of Crop Yields.*—Estimates of area and yield of principal crops are prepared and issued in the form of periodical crop forecasts. At the end of the agricultural year these are published in one volume

called the "Estimates of Area and Yield". The yield statistics available in this volume relate to rice, wheat, jowar, bajra, maize, barley, ragi, gram, sugarcane, cotton, jute, linseed, sesamum, groundnut, rape and mustard, castor seed, tobacco, coffee, tea and rubber.

1.15. Scope of the Crop Forecasts.—Usually two to three forecasts are issued in respect of each crop except in the case of wheat and cotton for which five forecasts are issued. The object of the first forecast is to afford intelligence as early as possible regarding area sown and the germination of the seed, together with information regarding the effect of the weather conditions at that time on the seedlings. It is issued generally a month after the sowings have been completed. The second forecast issued two months later, includes the area of late sowings and indicates the probable character of the sowings with information regarding the condition of the crop. The final forecast contains final estimates of the total area sown and quantitative estimates of the outturn harvested or expected to be harvested. Thus the final report stands on a different footing from the earlier forecasts, both as regards the objects and the information supplied. For, whereas the final estimate is largely concerned with the estimate of the quantity of crop actually obtained, the earlier reports are only aids to conjecture as to what the quantity will be. Further, for the purpose of earlier forecasts, the patwari, or the primary reporter is expected to give only a rough quantitative estimate of the area under the crop in the current year in relation to the previous year. The final estimates, on the other hand, are based on the field-to-field crop inspection made by the primary reporters in the temporarily settled provinces.

The estimates of area and outturn given in the final forecast are revised at the end of the year at the time of the release of the final forecast for the next year's crop. A General Memorandum containing a brief summary of the position regarding the condition of the crop in each province also was issued hitherto in respect of each crop. In case of jute an end-of-the-year review gives the utilization of the crop for various purposes presenting a sort of balance sheet giving the estimated production, opening stocks, quantities consumed by mills, quantities exported and the closing balance.

1.16. Official Method of Yield-estimation.—With respect to the method of estimating crop yield statistics the total outturn of a crop is obtained as the product of the area under the crop and the average yield per acre. The latter is usually obtained as a product of what is called the normal or the standard yield and the condition factor. In East Punjab, the average yield per acre is directly estimated by the eye. The normal yield is defined as the average yield on an average soil in a year of average character and is fixed on the basis of crop-cutting experiments carried in fields which are judged by the revenue officers as bearing an average crop. These standard yields are usually fixed for all time but are subject to revision once in five years on the basis of periodical crop-cutting experiments. The condition factor gives the condition of the crop in any particular season in relation to the normal crop. It is usually expressed in terms of annas, with a fixed number of annas representing the normal and is a subjective estimate. The smallest unit for which this condition factor is given by the reporting agencies varies from a village to a tehsil in the different provinces. The figures supplied by the lower officers are passed on to their immediate superiors who make a further guess in the light of their personal experience. The final figure of the average yield per acre for the province is fixed by the Director of Land Records or the Director of Agriculture, or both taking into account all available data.

1.17. *Defects in the Official Method.*—This method has been subjected to serve criticism. For, apart from the fact that the method is only subjective, the average of the condition factors taken over a series of years works out at a figure less than the corresponding anna equivalent of the normal. This might suggest that the present yield estimates are under estimates; but on the other hand there is reason to believe that the normal yields which were fixed long time ago are pitched at a higher level than what they should be.

1.18. *Improved Method.*—In recent years, the Government of India have taken up the question of improvements in the method of estimating yield statistics and the I.C.A.R. has been entrusted with the task of evolving a suitable method for estimating the outturn of principal crops. From the year 1934-44, crop-cutting surveys based on the random sampling technique are being conducted under the technical guidance of the I.C.A.R. in all provinces except West Bengal with the following objects in view:

- (a) to evolve a random sampling technique for conducting crop-cutting experiments which can be handled by the staff of the Provincial Departments of Agriculture and Revenue, who are ordinarily entrusted with these experiments, and which can be adopted by them as a departmental routine without heavy additional expenditure;
- (b) to demonstrate to the provinces the feasibility of adopting the method so devised;
- (c) to train the existing provincial staff in the technique;
- (d) to estimate the yield per acre for the province as a whole and also for individual districts, and
- (e) to revise the present set of district normal yields in due course.

1.19. *Random Sampling Technique.*—“The technique of random sampling consists, in principle, of choosing a sample of elements out of a given totality of elements comprising the population in a manner as to offer each element of the totality an equal chance of inclusion in the sample. The technique not only ensures that the sample is representative of the population but also provides the means of knowing how far one is likely to be in error in estimating any characteristic of the population on the basis of the sample. The advantages of such a method in yield estimation are that we are able to obtain an unbiased estimate of the average yield per acre and can determine, in addition the margin of error by which the estimated average yield is likely to depart from the true unknown value of the yield for the tract surveyed.”*

The actual plan of the survey consists in selecting by the principle of random sampling, a certain number of villages from each tehsil (or taluka) of the province, and in selecting within each village by the same principle, three fields (sometimes two) out of all the fields sown with the crop. In each selected field a plot, usually of size $1/8$ th of an acre ($33' \times 16\frac{1}{2}'$), is located at random. The experiment proper consists of cutting the crop from the plot so marked and having the produce threshed, winnowed and weighed immediately afterwards. Allowance for the residual moisture content is made on the basis of special experiments conducted for the purpose. The field work is carried out by the staff of the Revenue and/or Agricultural Departments under technical supervision of the statistical staff of the Council and similar staff from the provinces wherever available.

* SOURCE.—“Statistics of area and Yield of Crops in India” by Dr. P. V. Sukhearn—Agricultural Situation in India—March 1949.

1.20. *Results of Surveys not yet adopted for Official purposes.*—These surveys are at present carried out in respect, of principal foodgrains in almost all the provinces. A comparison of the official estimates of the average yield with those obtained by the method of random sampling has shown a considerable divergence between the two in a majority of the cases. On the whole, it has been observed that official estimates are usually under estimates. The results of the crop-cutting experiments during the last four or five years taken together would seem to indicate that the normal yields, as at present fixed, are pitched at a higher level than what they should be and as such would need revision. These surveys are still in an experimental stage and the results have not yet been finally adopted for official forecasts in all areas. The Provincial Governments are however convinced of the need for instituting these experiments as an annual measure for providing reliable estimates of the final forecast. Already most of the provinces consult the results of these experiments before formulating their final forecast. Some have even expressed their willingness to base the estimate of their final forecast entirely on the evidence of the results of crop-cutting experiments.

1.21. *Crop-cutting Surveys carried out by I.S.I.*—Crop-cutting experiments based on the method of random sampling are also being conducted on jute and paddy on a provincial scale under the auspices of the Indian Statistical Institute in West Bengal. The principles underlying these surveys are similar to those described in connection with the I.C.A.R. surveys, although there are certain fundamental differences in the details of procedure between these two surveys. For instance, while the village is the sampling unit for the I.C.A.R. surveys the I.S.I. does not select random villages as the villages being of unequal size cannot, strictly speaking, give every inch of land equal chance. Further while circular plots of 100 sq. feet are selected at random from the sample grids by the I.S.I. (the sample cut being located with the help of rigid iron rods as radii) the plot sizes adopted for the I.C.A.R. surveys are rectangular in shape and much larger in size. The Institute surveys are conducted by special staff of field investigators while the I.C.A.R. surveys are conducted through the existing agencies of the Revenue and Agriculture Departments.

LIVESTOCK AND OTHER STATISTICS

1.22. *Statistics of Livestock, Poultry, Agricultural Implements and Machinery.*—The other important agricultural statistics collected at present, besides the statistics of area and yield of crops, are those relating to the numbers of livestock and poultry, agricultural implements and machinery. At present a quinquennial livestock census including a census of agricultural implements and machinery is taken in all the provinces and most of the states. In C. P. and Berar and Bombay, the census is conducted annually. Although in principle the census is based on an individual house-to-house enumeration of livestock and poultry, the figures collected are often unreliable and subjected to severe criticism because of want of training of the enumerating staff and lack of adequate supervision of their work. The last livestock census was taken in 1945. The next census falls due in 1950 but the Government of India have decided, on the recommendation of the Provincial Ministers' Conference held in September, 1948, to postpone it and conduct it as part of the agricultural census.

1.23. *Statistics of Milk and Eggs.*—With respect to the statistics of animal husbandry products, practically no data is regularly compiled. The

only estimates of yield of milk and production of eggs that are at present available are those given in the respective marketing reports and are based on *ad hoc* surveys conducted some years back.

1.24. *Statistics of Irrigation*.—As regards statistics of irrigation, data relating to the area irrigated from different sources and the gross area of crops irrigated by these sources is collected in almost all the provinces by a method similar to that employed for the collection of statistics of acreage under crops. In the Khasra Register, the source of irrigation is usually indicated by a suitable symbol along with the area under the crop, at the time of harvest-inspection. In addition to these statistics, census of sources of irrigation is also taken either annually or quinquennially and the data is published in the provincial Season and Crop Reports. No all India statistics are at present compiled with respect to the available sources of irrigation as distinct from the area irrigated therefrom.

1.25. *Harvest Prices*.—The other important agricultural statistics collected relate to the prices of the principal crops prevailing at harvest time. The methods at present followed in the compilation of these harvest prices are not uniform in the different provinces. In some provinces the harvest prices represent the wholesale prices while in others they are based on the retail prices prevailing during the harvest season. The data is collected through normal reporting agencies for the collection of area statistics and is published in Table VII of 'Agricultural Statistics of India' Vol. I for provinces. No data is at present available in respect of the Indian states.

1.26. *Incidence of Land Revenue*.—Statistics of land revenue showing the incidence of land revenue and assessment on the area and population in respect of each of the principal types of tenures in all the provinces and some of the states are collected periodically (*i.e.* once in four or five years) from the existing revenue records and published in Table VI of 'Agricultural Statistics of India'. No information is compiled regarding the number of holdings (ownership) on which this revenue is assessed, although this data also can be obtained from the revenue records.

1.27. *Wages of Agricultural Labour*.—No statistics of wages of agricultural labour are collected regularly at present. The only information now available is that given in the quinquennial wage census reports published by some of the Provincial Governments. These wage censuses are taken at different times in different provinces and hence the data is not of much utility for drawing inter-provincial comparisons.

1.28. *Miscellaneous Agricultural Statistics*.—In the sphere of agricultural economics no regular data is compiled at present. Whenever necessity arises some *ad hoc* surveys are conducted from time to time either by the Government or under the auspices of the various research institutes, employing the agency of special staff. Since the surveys are neither planned nor co-ordinated from an all-India point of view and are carried out at different times, the results of these surveys are of limited applicability. The detailed position in respect of enquiries into the cost of production of principal crops, marketing surveys in respect of the different crops, and enquiries into rural indebtedness is indicated below:—

- (i) *Cost of production enquiry*.—Isolated investigations into the cost of cultivation in rural areas have been conducted from time to time from the year 1917. The only survey conducted on an all-India basis is the one carried out in 1933-36 under the auspices of the Indian Council of Agricultural Research for estimating the cost of production of principal crops grown

in the sugarcane and cotton-growing tracts in India. More recently, the Punjab Board of Economic Enquiry, the Gokhale Institute of Economics and Politics and the Viswa Bharati Institute have been conducting studies into Farm Accounts in representative areas in their respective provinces. An enquiry into the cost of cultivation of jute was carried out by the Indian Central Jute Committee, in selected villages in Bengal. This survey is being extended to other jute growing areas also. In the U. P. and Assam, rural economic enquiries including cost of cultivation within their scope are being carried out at present in selected villages.

- (ii) *Marketing surveys*.—Surveys into the marketing of different crops have been conducted during the years 1933-37 under the auspices of the Central Agricultural Marketing Department on an all-India scale. The results of these surveys are published in the various reports dealing with the respective commodities. The data relating to the various aspects of marketing was collected on the basis of replies received to questionnaires mailed to producers, government officials, chambers of commerce, traders and other interests. This information was supplemented by first hand investigations carried out by marketing officers and specially appointed investigators who toured the country. Recently, the Marketing Department has been revising some of the earlier reports and giving revised estimates for later years.
- (iii) *Rural Indebtedness*.—Apart from the estimate of rural indebtedness given in the Central Banking Enquiry Committee report in the year 1930, no up-to-date estimates for the Indian Union as a whole are available. As in the case of cost of production enquiries, isolated surveys have been carried out and regional estimates prepared in respect of rural indebtedness in some areas. The latest enquiry conducted on a provincial basis is the one carried out in Madras under the auspices of the Provincial Government* but no similar data is available in respect of other provinces.

1.29. *Conclusion*.—It will thus be seen that a fairly large amount of statistical data relating to agriculture is collected at present by various agencies both as a matter of routine and through *ad hoc* enquiries. There are, however, wide gaps in the available statistics and the methods of collection are defective in many respects. The whole system of collection of agricultural statistics requires careful planning, greater co-ordination and proper organization

* "Report of the Economist for enquiry into Rural Indebtedness"—1946—
By Dr. B. V. Narayanaswami Naidu.

CHAPTER II

DEFECTS IN AGRICULTURAL STATISTICS

2.1. *Defects.*—The need for accurate agricultural statistics for proper agricultural planning has never before been so keenly felt by the Government. In order to organize the collection of agricultural statistics on a systematic basis, it is necessary to examine the defects in the existing statistics. The most important of these may be classified as under:

- (i) gaps in coverage;
- (ii) lack of uniformity in definition and classification;
- (iii) defects of tabulation and processing;
- (iv) defects of the primary reporting agency;
- (v) defects of inspection, supervision and checking; and
- (vi) defects of planning and co-ordination.

2.2. *Gaps in Coverage.*—The gaps in coverage are of two types *viz.* (a) gaps in geographical coverage and (b) non-availability of statistics in respect of certain items.

- (a) *Gaps in geographical coverage.*—(i) With respect to the geographical coverage of the acreage statistics, as already stated, the available agricultural statistics relate to only 71 per cent. of the total geographical area of the country and no estimates are at present available in respect of the remaining 29 per cent. of the area. The present anomalous position will be evident from the fact that in preparing the Food Balance Sheets, while for purposes of estimating the food requirements of the country the total population of the Indian Union is taken into account, corresponding figures of production of major foodgrains for the whole geographical area covered by the population are not available and approximate and conventional estimates have to be framed for the non-reporting areas. Most of the non-reporting areas are not cadastrally surveyed and this is the chief impediment in the way of a proper organization of collection of agricultural statistics in these areas. In those non-reporting areas which have been surveyed, there does not exist any primary agency for crop reporting.

The agricultural statistics of India cannot be said to be complete till estimates of acreage under the principal heads of land utilization and under crops are available in respect of the entire geographical area of the country and estimates of agricultural production are obtained for every acre of land cropped.

- (ii) Mention has already been made of the incomplete coverage of statistics of harvest prices, which are not available in respect of the Indian states. So also, the returns for Table VI of 'Agricultural Statistics of India' *viz.* Incidence of Land Revenue are furnished only by a small number of reporting states.

- (b) *Non-availability of statistics in respect of certain items.*—(i) As regards the statistics of agricultural production, there are still some important gaps in respect of the production of minor cereals and pulses, principal condiments and spices, fruits and vegetables, fodder and cattle feeds.
- (ii) There is no information regarding cultivators' holdings. Any measure of reform which the State may wish to put through in the sphere of agricultural development can be implemented only through the agency of the cultivator proper. The emphasis which has hitherto been on the land holder has now to be shifted to the land tiller. Recent trends in agricultural legislation and land revenue policies also point in the same direction. It is only a proper study of the cultivator's holding in relation to the various factors influencing cultivation and affecting the agricultural economy that can suggest the measures that are necessary to step up agricultural production. It is therefore necessary to collect the data on the various characteristics of cultivators' holdings in a correlated manner.
- (iii) The absence of data in respect of statistics of animal husbandry products has already been mentioned in the previous chapter.
- (iv) In the field of agricultural labour also, no reliable data is collected even with regard to the wages of agricultural labour.
- (v) The available statistics in the field of agricultural economics are scanty and it is necessary to collect reliable data on costs of production of principal crops, utilization of agricultural produce, rural indebtedness etc.

2.3. *Lack of Uniformity in Definitions and Classification.*—Even the available statistics are not of the same degree of accuracy in the different provinces and are sometimes not comparable due to lack of uniformity in the definitions and classification adopted. The procedures and methods of computation also vary from province to province. The main defects are described below:—

- (i) The method of obtaining area statistics differs between temporarily settled provinces and permanently settled provinces. Area statistics for the latter provinces are admittedly much less reliable than those for temporarily settled provinces. The method of field-to-field inspection of crops is followed in the temporarily settled provinces while in the permanently settled provinces it is not being followed for lack of a suitable agency except that in Bihar and Orissa, where complete enumeration of area by field-to-field inspection has been recently taken up with the help of specially appointed field staff.
- (ii) In the existing classification of area adopted for Table II of Agricultural Statistics of India, the definitions of items entering the classification are not uniform in all provinces, e.g., the definitions of fallow land, culturable waste, etc. differ from province to province.
- (iii) The method of estimation of average yield per acre also varies from province to province. While generally the average yield per acre is obtained as a product of normal yield and the condition factor, in the East Punjab, it is estimated directly in terms of maunds per acre.

- (iv) The condition factor which gives the condition of the crop in any year in relation to the normal crop is expressed in the annawari notation. But the anna-equivalent of the normal crop is not the same in all the provinces, and differs even within the same province, as in Orissa. While the normal crop is represented by 12 annas in some provinces, (with 16 annas representing the full crop) it is denoted by 13.3 annas in the C. P. and Berar and 16 annas in other provinces. The methods of averaging adopted for computing the district and provincial average condition factors are also not uniform.
- (v) The definition of harvest price is not uniform in the different provinces. While in some provinces the harvest price is taken to be the average wholesale price prevailing at important markets during harvest time, in others it denotes the average retail price of the commodity during the specified harvest time.
- (vi) Similar divergence in the methods adopted exists in respect of recording areas under mixed crops, of uncultivated patches in a cultivated field and of area under bunds. These defects and the uniform procedures suggested for adoption are discussed fully in the next chapter.

2.4. Defects of Tabulation and Processing.—Moreover a good deal of data now collected runs to waste for want of proper processing. Even at present, a lot of useful information is available at the primary source but is not properly tabulated and cannot therefore be of much use for developmental purposes. The following instances illustrate this point:—

- (i) In the East Punjab, Delhi and C. P. and Berar, information regarding transfers of agricultural property is collected for each village by the patwaris in standard forms prescribed for the purpose, from the mutation registers and the record of rights. This information, however, is not consolidated beyond the tehsil stage; and hence no figures for the province as a whole are readily available. In other provinces, even though the information could easily be abstracted from the existing records, this is not done.
- (ii) In Bombay and a few other provinces, a census of sources of irrigation giving the number of wells, tanks, etc. is taken once in five years, but the data is not correlated in any manner with the number and area of holdings irrigated from these sources.
- (iii) Data regarding ownership holdings is compiled once in five years in the different provinces; and tables showing the total area under different types of tenure and the incidence of land revenue per acre and per head of population are prepared for each province. But no attempt is made to compile similar abstract statements in respect of cultivators' holdings.

2.5. Defects of the Primary Reporting Agency.—Although statistics of acreage are collected as part of land records in the temporarily settled provinces, the data at present collected is often not reliable on account of the defects of the primary reporting agencies. The experience of the Indian Council of Agricultural Research which has been conducting crop-cutting experimental surveys does not show any marked errors in the estimates of area recorded by the patwaris in the field books. But complaints are frequently made and doubts have been expressed regarding the accuracy of the statistics furnished by the patwaris in the temporarily

settled provinces. Recent investigations in Bombay have shown that there is considerable scope for error in distinguishing between areas under jowar harvested as food grains and as fodder, and recording the areas accurately. The actual degree of accuracy and reliability of the acreage statistics in the different provinces needs checking and verification.

2.6. Inaccuracies due to heavy Burden of Work.—One of the chief causes for the inaccuracies in the reporting of the primary agency is the large increase in the work of the patwari who has a heavy burden to bear. When compared with the pre-war days, the patwari is now called upon to undertake multifarious duties connected with various departments of Government being the only official in the village. As such, he has little time to devote to the proper compilation of agricultural statistics. This is particularly true if the patwari has got large jurisdiction and is expected to do field-to-field crop inspection in say more than 5,000 survey numbers during the course of 4 to 6 weeks. He is besides also employed as the primary enumerator for all kinds of *ad hoc* enquiries initiated by the Government, ranging from the preparation of electoral rolls to the compilation of census of refugees. The patwari usually has no instructions as to the priority to be given to the different enquiries, and hence goes on treating all of them in the same manner, resulting in slipshod work with respect to each. An important step necessary in the improvement of agricultural statistics is a reduction of the charge of the patwaris.

2.7. Inaccuracies due to Neglect and Bias of the Primary Reporting Agencies.—Besides the excessive strain on the patwari, there is another factor which is responsible for introducing a deliberate bias in the reports of the patwaris. The collection of agricultural statistics assumed a special importance in these days of controlled production and distribution of agricultural commodities. The statistics collected are utilized for purposes of drawing the various plans and enforcing them. Thus either for procurement of foodgrains or for their distribution, the patwari is the primary agent from whom the requisite statistics are collected. Similarly, for the enforcement of schemes of diversion of acreage from non-food crops to food crops, the statistics collected through the patwaris provide the basis. There is thus created a definite incentive for the patwaris reporting biased estimates. For instance, in order to soften the rigours of procurement, the patwari may well under-estimate the crops outturns. Although elaborate rules are prescribed for periodical crop inspections in the Land Records Manuals, these rules are often not followed in practice.

2.8. Lack of Adequate Supervision.—The supervision of the work of patwaris is exercised by the tehsildars and the kanungos in the temporarily settled provinces. The tehsildar who is a touring officer is expected to visit a certain number of villages under his jurisdiction in the normal course of his tour and inspect the work of the patwaris. In the midst of his administrative duties, he usually is unable to devote any personal attention to the supervision of agricultural statistics and this apathy is also partly responsible for the negligence on the part of the patwaris.

Moreover, the methods of supervision and checking also need to be rationalized. For instance, at present, the tour programme of these officers who are on inspection tour is intimated well in advance to all the patwaris so that the patwaris know the villages which will be inspected. They may thus pay special attention to the land records in these villages with the result that the superior officers receive a favourable impression which however is not really justified. If, on the other hand, surprise visits were paid to the villages, and the villages chosen for inspection and

the fields in the village in respect of which the entries were to be checked were selected at random, the patwaris will be forced to exercise greater care in their work and the supervising officer will get a clearer and more accurate picture of facts.

The kanungos and the tehsildars also in some areas have too large a jurisdiction which makes it impossible for them to check up a sufficiently large percentage of the work of the patwaris.

2.9. Lack of Co-ordination.—Yet another defect in the present system is the lack of proper planning and co-ordination in the various types of data collected in the course of their routine duties by the officers of the Revenue, Agriculture and Local Self-Government Departments. This lack of planning and co-ordination is all the more glaring when *ad hoc* surveys are conducted for obtaining data on specific items required by individual departments. A few instances may be quoted in this respect.

- (i) In Mysore, in addition to the quinquennial livestock census which is carried out with the help of honorary enumerators, an annual *khanesumari* is taken by the shanbogs (patwaris). The annual enumeration covers the particulars of each holding, the number of members of the family, extent of the holding, if he is a cultivator, livestock possessed by him and the agricultural implements. It is doubtful whether such an annual *khanesumari* is necessary when the information is already obtained once in five years, through the quinquennial livestock census.

Similarly in Jaipur, where there is a continuous record of the cattle population in the rural areas, a separate quinquennial livestock census would be unnecessary.

- (ii) In some of the provinces the Departments of Agriculture and Food or Civil Supplies obtain estimates of food production independently of each other and often the estimates arrived at by the two are at variance.
- (iii) The lack of co-ordination is also glaring in respect of statistics of food distribution and GMF campaign. The additional production achieved as a result of the various GMF schemes is not properly correlated with the procurement of foodgrain during the same period. Nor are the statistics of procurement related to those of off-take. In order to assess the achievements of the GMF campaign, it is necessary to co-ordinate and correlate the data relating to the GMF and food distribution statistics properly.

2.10. Insufficient Attention paid to Agricultural Statistics.—In conclusion it may be stated that the present unsatisfactory position is due to the fact that the collection of agricultural statistics was in the past treated as only incidental to the collection of land revenue. The preparation of forecasts of crops was taken up later at the instance of persons interested in trade. It has however never been realized until lately that accurate statistics are the very foundation on which any developmental plans can be based. The collection and compilation of statistics has therefore remained more or less a bye-product of either official activities or a luxury which could be enjoyed in relatively easy times and skipped over in times of difficulty. The data collected has therefore usually tended to be patchy, its compilation and processing haphazard. A good deal of the data now

collected runs to waste for want of proper processing, while a lot of additional information can be collected at no extra cost by proper planning and integration.

The improvements that are necessary in order to remove these defects and place the collection of agricultural statistics on a systematic and sound footing are described in the next chapter.



CHAPTER III

IMPROVEMENTS IN AGRICULTURAL STATISTICS

3.1. *Various Types of Data Required.*—Various types of statistical data are required in connection with the GMF campaign, the abolition of the Zamindari system, the introduction of tenancy legislation or the proper planning of land utilization and irrigation schemes. The existing data is inadequate to meet the requirements and hence the information has to be collected through special measures. At present, whenever occasion arises, the data for such purposes is collected by the departments concerned through the normal reporting agencies, thus resulting in additional pressure on these agencies which invariably leads to inaccuracies in the data. In organizing the collection of agricultural statistics, therefore, the additional requirements of data for formulating plans of agricultural development have to be borne in mind.

3.2. *Principles of Classification of Data.*—The information that is at present collected as part of routine agricultural statistics and the additional data that is necessary, may be classified according to the following criteria.

- (i) Firstly, there may be some items in respect of which data will have to be collected annually while there may be others in respect of which collection at less frequent intervals, say once in five years, may suffice. This distinction may have to be made either because of the character of the data, *e.g.*, their variability or because of the purpose for which it is required, *e.g.*, fixation of prices. In the former class will fall items such as statistics of acreage under crops, land utilization, area irrigated, estimates of outturn of principal crops, harvest prices etc. and information with respect to these will have to be collected every year. In the latter class will fall items relating to the economy of the cultivator's holding such as characteristics of farm population, number of livestock and agricultural implements, sources of irrigation and data relating to these may be collected at less frequent intervals, say once in five years.
- (ii) Secondly, there may be some items in respect of which it is necessary to obtain information from every individual cultivator, while there may be other items in respect of which the information may well be collected from only a sample of the cultivators. It may also be that in respect of some items, more detailed information from a comparatively small sample may be preferred to limited information from a complete enumeration; while in respect of others, information from a sample may be considered desirable in addition to complete enumeration as a check that it provides. For instance, a complete enumeration is desirable in respect of statistics of acreage under crops, broad characteristics of farm population, such as the number of cultivators, and their dependents, number of livestock and implements. On the other hand, outturns of crops can be estimated only by a sample enquiry. From such an enquiry, ancillary information in regard to area under improved varieties of crops, use

of manures and types of soils and their yield potential can also become available. A sample check over the estimates of acreages obtained by complete enumeration has already been referred to.

- (iii) Thirdly, there are items on which information is immediately required and others with regard to which we can afford to wait for some time. For instance, data on costs of production of crops which is so essential for price fixation and grant of subsidies to cultivators is immediately needed. So also are the various types of data needed for developmental plans. An assessment of the achievements of the GMF campaign is of vital interest and the required data should be collected immediately. Information regarding the utilization of agricultural produce, the products of animal husbandry and poultry products etc. is of relatively less urgency.

3.3. Detailed Steps Necessary.—Based on these general principles, the detailed steps necessary for organizing the collection of agricultural statistics in respect of acreage, yield, cultivators' holdings, and miscellaneous agricultural statistics are discussed below in Section A, B, C and D respectively.

SECTION A—ACREAGE STATISTICS

3.4. General Principles underlying the Collection of Acreage Statistics.—The statistics of acreage should be based on a complete enumeration of the individual survey numbers into which the total geographical area of the country is divided, as is at present done in the temporarily settled provinces and in Bihar. Since all developmental measures have to be ultimately implemented on a village basis, it is necessary to collect data in respect of each village which is the smallest administrative unit. Thus a complete enumeration of all the survey numbers is essential for the accurate determination of the acreage statistics. If the existing statistics are not reliable, the remedy does not lie in abolishing the system but in removing the causes responsible for the inaccuracies. The Famine Enquiry Commission and the Inter-Departmental Committee on Official Statistics who have considered this question have also recommended that the acreage statistics should be based on the method of complete enumeration of areas.

3.5. Random Sampling for Areas not a Substitute for Complete Enumeration.—The method of random sampling for acreages cannot be a substitute for the complete enumeration method. For, although the sample survey can give reliable estimates of area under principal crops for the province as a whole, it will not yield accurate figures for smaller administrative units such as tehsil or district and in respect of minor crops. The method of random sampling may however be adopted for rationalizing the existing procedure for supervision of the collection of acreage statistics.

3.6. Complete Enumeration not feasible in Unsurveyed Areas.—The method of complete enumeration of survey numbers for estimating the acreage under crops is possible only when the whole area is cadastrally surveyed and when the field maps are available. Then it is only a question of employing a suitable reporting agency for filling in standard forms for the complete enumeration of survey numbers, based on a field-to-field inspection.

Obviously the same method is not feasible in the unsurveyed areas where the land is not demarcated into survey numbers and hence these do not exist. But actually in some of these areas, even now estimates

of crops are being reported by suitable reporting agencies. In Madras, where about one third of the cultivated area is covered by Inam and Zamindari villages, most of which have not been surveyed, there exists a patwari agency which reports estimates of area for these unsurveyed villages also. As the duties of the patwaris in Inam and Zamindari villages are, by their very nature, different from those in the corresponding ryotwari villages, the patwari does not take the trouble to assess the increase or decrease in the areas under cultivation systematically. Nor is there any scientific method which enables him to prepare such estimates, in the absence of a cadastral survey. In other areas where no reporting agencies exist, as in the case of non-reporting Indian states, no estimates are prepared. The problems in (a) unsurveyed areas where reporting agencies exist and (b) unsurveyed areas where they do not exist are discussed below separately.

3.7. Method of Collection in Areas where Reporting Agencies exist.—With respect to the unsurveyed areas where patwaris exist, the experience of the patwaris should be utilized for collecting agricultural statistics. Although a complete and detailed survey required for revenue purposes may take considerable time, it should not be very difficult to prepare outline sketch maps for each village, especially where the primary reporting staff have revenue experience and are well acquainted with the conditions in the village. Each patwari can prepare a map for his own village or villages, with the assistance of estate agents in the course of a few months. After the sketch maps are prepared, estimates of areas of each of the fields can also be entered on the map either by actual measurement or by utilizing the records of the Zamindar. It will however be necessary to appoint specially trained additional supervisors, similar to revenue inspectors, to supervise the work of preparation of these sketch maps for a period of six months. Once these basic records are prepared, the collection of agricultural statistics in the subsequent years will be greatly facilitated. The Deputy and Assistant Directors of Surveys of Madras agree that this is the only method to be adopted in these unsurveyed villages of the Madras Presidency. The preparation of such outline sketch maps should be taken in hand immediately and the trained supervisors should be appointed, so that the required material will be available at a very early date.

3.8. Unsurveyed Areas where no Reporting Agencies Exist.—The remaining unsurveyed areas where no reporting agencies exist, may broadly be divided into three categories, depending on the nature of the topography. Firstly, there are isolated blocks of forest areas, area under river beds, area occupied by mountains or barren land, which are not surveyed. Secondly, there are large tracts covered by forests and mountains with scattered areas under cultivation. Thirdly, there are lands in the plains which are held under the permanent system of revenue settlement and which are not surveyed. The methods to be adopted in these three types of areas will naturally be different.

3.9. Isolated Patches of Unsurveyed Areas.—In the unsurveyed areas of the first category, it is generally known to what type of classification the whole area belongs and the area may be classified accordingly. The unsurveyed areas in the East Punjab and the forest area in 24 Parganas of West Bengal and in Bihar, belong to this category.

3.10. Unsurveyed Tracts of Forest and Mountainous Areas.—In the unsurveyed areas of the second category, the problem is more difficult. The 20 million acres of unsurveyed area of Assam which is mostly covered with mountains and forests provides a typical example of the problems

to be faced in these unsurveyed areas. The smallest area for which the perimeter and the geographical area are known is the sub-division which may be as large as two to three thousand square miles. Although each sub-division is divided into thanas, in some cases, there is over-lapping in the jurisdiction of two neighbouring thanadars for want of a clear line of demarcation between the two thanas. Moreover some of these areas are accessible only for a portion of the year, and the reporting agencies have to restrict their operations to this part of the year only.

3.11. *Methods of Survey in these Areas.*—A complete and detailed survey of these areas is out of question for the time being, both in view of the expenditure involved and the time taken for completion. In the absence of the detailed survey, since the statistics of land utilization and area under crops cannot be obtained by complete enumeration of the survey numbers, the need arises for studying alternative methods of survey. The following methods are suggested:—

- (i) a complete enumeration of cultivated areas through special staff;
- (ii) a sample survey for acreages; and
- (iii) a photographic survey.

3.12. *Method of Enumeration of Cultivated Blocks.*—With respect to the first, as in these areas, it often happens that the cultivated areas exist in blocks, the problem of completely enumerating the cultivated blocks, measuring if necessary the approximate length and breadth of each block, is feasible. In fact, a similar method is adopted in the Koraput Agency of the province of Orissa under the scheme for the improvement of agricultural statistics.

The objective, however, should be not only to collect the details of cultivated land but also of uncultivated land. As a matter of fact, it is the accurate classification of uncultivated land that can reveal the potentialities for development. While, however, it will be relatively easy to measure the cultivated areas, it will be difficult to assess the extent of the uncultivated land and its classification, in the absence of any previous estimates of areas. As an alternative, perhaps in addition to the cultivated area we may also enumerate areas utilized for pasture, fodder growth and grazing and other culturable waste land. Since the total geographical area of the sub-division is known, the residue accounts for the other forests and uncultivated land. Even this complete enumeration requires a large staff since most of such forest and hill regions are not easily accessible and the available facilities for transport are scanty. It has been estimated that one person can on the average enumerate about 10 square miles a year. On this basis, the enumeration, to take an illustration, of the unsurveyed tracts of Assam covering about 30,000 square miles will require the employment of 3,000 persons for one year.

3.13. *Sample Survey Method not Feasible.*—With respect to the second method, although it is theoretically possible to employ the sampling technique for obtaining the areas of crops, the practicability of employing the technique in such regions has yet to be explored.

3.14. *Aerial Photography Method.*—The possibility of using aerial photography in India for the estimation of the area under different crops in regions where no regular cadastral survey has been carried out and where no primary reporting agency exists, has been studied by the Indian Council of Agricultural Research. The Statistical Branch of the Council has so far carried out, in collaboration with the Surveyor General of India, three surveys in both the rabi and kharif seasons of 1947-48. A total of

34 villages selected from Delhi, U. P. and Bihar have been photographed from the air just before the commencement of harvesting, the scale of photograph used being 4" to a mile in two surveys and 6" to a mile in the third. Two trained investigators have been entrusted with the interpretation of the photo prints of the air photographs taken. An examination of the photo prints however showed that where the fields were small or where contiguous fields grew different crops or where more than one crop was grown in the same field in separate patches or as a mixture, there were considerable difficulties in identifying the actual crops. This has demonstrated that ordinary photography, on the scale used in the two surveys was not likely to yield satisfactory results. The alternative method of utilizing red and yellow colour filters to facilitate identification of crop mixtures also proved disappointing. The experiments are still being continued with a view to explore further the possibility of facilitating accurate interpretation by the use of colour photography or other types of filters and also by increasing the scale of photography, if necessary.

Thus the experience so far gained does not appear to indicate the feasibility of adopting the aerial photography method, even in the plains. It is doubtful whether in the case of the mountainous tracts of Assam, especially with regard to the cultivated areas in gorges and patches of cleared forest, the photographic print will enable the identification of the different types of cultivated lands.

3.15. *Unsurveyed Areas in Plains.*—In the third category of unsurveyed areas in the plains, where no primary reporting agency exists, i.e., in areas like the permanently settled plains portion of the Golpara district of Assam, no village boundary exists and no field maps are available. Most of the area is cultivated and no compact blocks of cultivated land exist as in the previous case. In these areas, the willing co-operation of the zamindars who hold these lands and who possibly would have the relevant figures with them, should be sought in obtaining the acreage statistics. This method may be adopted as an interim measure in the local conditions of Assam but cannot be recommended as a permanent solution of the problem.

3.16. *Methods suggested in Unsurveyed Areas.*—Permanent improvement in the collection of agricultural statistics in the unsurveyed areas can be achieved only when the whole area is cadastrally surveyed. A beginning should therefore be made immediately and the necessary steps should be taken to initiate the cadastral survey operations, in these areas, even though it may take a long time before they are completed.

Meanwhile, in those areas where village patwaris exist, the preparation of out-line sketch maps, as mentioned earlier, should be undertaken immediately. The reported agricultural statistics should be based on these maps. In other unsurveyed areas, where an annual complete enumeration of the whole of area is not feasible, a complete enumeration of only the cultivated areas and specified types of culturable wastes should be carried out once in five years.

For giving the data in the intermediate years, it is necessary to examine whether the method of random sampling could be employed for getting the acreage statistics. Provided a suitable reporting agency is created in these areas, it should not be difficult to devise a proper procedure of random sampling for estimating the acreage statistics with the help of the cultivators. Suitable pilot investigation should be undertaken taking into account the previous experience, if any, available in this connection.

3.17. *Steps necessary in Indian States.*—The problems in the states are similar to those discussed above in relation to the provinces. Where the states have merged with the neighbouring provinces, the Provincial Governments should extend the system of reporting as adopted in the province to the merged areas also. It is understood that some of the provinces have already taken steps in this direction. In the unions of states that have been formed, the patwari agency needs to be extended to areas where such agency did not exist. This question is already engaging the attention of the Governments of the states unions. In individual states like Mysore and Hyderabad, a patwari agency is in existence and is functioning. In regard to unsurveyed areas in the states, the method suggested in para. 3.16 above will have to be adopted as a temporary measure.

3.18. *Improvements in Classification of Crops.*—Besides the improvements in the methods of recording the acreage statistics, attention must be paid to the improvements in the existing classification of the data adopted for the statistics of acreage. The need for having statistics of acreages under kharif and rabi food crops separately was felt in drawing up the Basic Plan for cereals and the classification adopted for the food-grains has now been suitably enlarged to give the areas under winter, autumn and summer rice and the areas under kharif and rabi jowar separately. The consequent changes in the classification of Table III of 'Agricultural Statistics of India' showing the irrigated area should also be made. Similarly, the headings under which the areas under different oil-seeds, condiments and spices, and fruits and vegetables are given in 'Agricultural Statistics of India' also need amplification. The statistics of areas should be given separately for edible and non-edible oilseeds, different condiments and spices, and certain specified varieties of fresh fruits, dry fruits, summer vegetables and winter vegetables.

3.19. *Improvements in Classification of Area.*—The existing classification adopted for Table II of 'Agricultural Statistics of India' gives the details of area under (i) forests, (ii) barren and uncultivated land, (iii) other uncultivated land excluding current fallows, (iv) current fallows, and (v) net area sown. It will be seen that this classification is very broad and does not give a clear picture of the actual area under the different categories of land utilization.

The definitions of the items given in the classification are not uniform in all the provinces. For instance, the period after which fallow land is classified as culturable waste, varies from two years in the East Punjab to ten years in Bombay, and all areas shown under uncultivated land excluding current fallows are not real culturable wastes. The revised classification should give the areas separately in respect of (i) forests, (ii) barren and unculturable land, (iii) land put to non-agricultural use, (iv) culturable waste, (v) permanent pastures and other grazing lands, (vi) miscellaneous tree crops, (vii) current fallows, (viii) other fallow land and (ix) net area sown. The various items entering the classification should also be precisely defined and standard definitions (given in Appendix II) should be adopted in all the provinces and states.

3.20. *Other Improvements in Acreage Statistics.*—Whatever be the method followed, the classification adopted and the agency employed for the compilation of statistics of area, there are certain inherent difficulties in recording the acreage under a crop accurately, which have not hitherto received much attention. These are in respect of recording areas under mixed crops, estimating the area of uncultivated patches in a cultivated field, excluding the area under the bunds from the acreage under the crop,

differentiating between the sown and harvested areas, recording areas sown with the same crop in two or more seasons in a year and the methods of estimating the areas under fruit trees. These problems are discussed below.

3.21. *Existing Method of Recording Area under Mixed Crops*—The chief difficulty in arriving at correct estimates of crop areas arises out of the practice of mixed sowing. Mixed cropping is practised more or less all over India, mainly as an insurance against the vagaries of the weather.

The principal method of recording area under mixed crops consists in recording for each field the area covered by the mixture, totalling areas for the district and allocating the total to the component crops in accordance with the fixed ratios prescribed by the provincial authorities. This is being followed in the U.P. and the C.P. These ratios have been fixed long ago and need to be revised. From the data obtained in the course of crop-cutting surveys conducted by the I.C.A.R., it has been observed in the case of U.P. that the actual ratios differed from year to year. Moreover, such ratios are fixed only for principal crop-mixtures and in the case of minor crop-mixtures, the area under the mixture is entirely assigned to the area under the principal crop.

In the second method now followed in the East Punjab and Berar, the patwari in the course of his crop-inspection makes a judgment, by the eye, of the ratios in which the mixtures are grown and apportions the gross area under the mixture to the component crops at the source itself. The method is straightforward when the constituent crops are grown in separate rows, as for instance, in the case of cotton-pigeon-pea mixture. But in other cases, the apportionment is merely of the nature of guess-work, being more dependent on the relative stand of the two crops at the time when the estimate is made. The methods followed in the different provinces are summarised in Appendix V.

The difficulty of estimating accurately the area under each of the component crops need not however affect the accuracy of the estimated outturn, provided the yields are based on crop-cutting experiments in randomly selected fields, because the gross area under the mixture can be multiplied by the average yield per acre of the gross area. The present method of estimating the production on the basis of normal yields determined from traditional crop-cutting experiments conducted in fields growing pure crop only implies that the yield per acre of the net area is the same whether the crop is grown mixed or pure, and is therefore open to objection.

3.22. *Procedure Suggested*.—The ideal procedure to be adopted for accurate estimation of area under mixed crops would be as follows:

- (i) In all cases the gross unadjusted acreage of the mixture should be recorded separately for each major crop-mixture and published in the Season and Crop Reports and Crop Forecasts, side by side with the net acreages of the components, calculated according to the present practice.
- (ii) Where fixed ratios are used, they should be fixed for each district and their accuracy should be tested at periodical intervals during the crop-cutting surveys.
- (iii) For minor crop mixtures, the areas should be allocated to the various components as is at present done in the East Punjab and Berar.

3.23. *Estimation of Uncultivated Patches in Cultivated Fields.*—The next difficulty is with regard to the estimation of patches of uncultivated land in cultivated fields. Usually, in the temporary settled provinces, unculturable patches in a survey number for which no assessment of revenue is made are shown separately in the Khasra Register as 'Pot Kharab'. The net cultivated area assessed is also worked out and this area alone is taken into account while entering the area under the crop at the time of crop inspection. Hence such permanent uncultivated patches are not included in the cultivated area. In the case of temporary uncultivated patches, however, the patwari is usually expected to make an eye-estimate of the area of the patch and make due allowance for this in the area under the crop recorded. In the Land Records Manuals of certain provinces it is prescribed that such uncultivated patches should be measured with the help of poles and chains, although this provision is not enforced strictly in practice in a majority of the cases. A reasonably accurate estimate of the area of the patches is however desirable. The methods followed by different provinces for estimating the areas of uncultivated patches are summarised in Appendix VI.

3.24. *Recording of Area under Bunds.*—Bunds surrounding the fields are of two types. One is the permanent bund running along the boundary common to two adjacent fields belonging to different cultivators. The other is the temporary bunds within a survey number which subdivide the whole field into a number of plots. The existing practice in respect of recording area under bunds varies from province to province. But generally in the case of permanent bunds, more than 6 feet wide, the area occupied by the bund is excluded from the area of the survey number. In other cases the area under the bunds is equally divided between the two adjacent survey numbers and included in the areas of the two survey numbers. In some provinces a small allowance due to bunds is made in assessing the land revenue, the area occupied by bunds being treated as 'ghair mumkin'. Only the remaining area is counted under the crop. In other provinces where this area under the bunds is not separately recorded, the area reported under the crops includes area occupied by the bunds. In the case of temporary bunds within a field, the area is invariably included in the area under the crop. The methods adopted in different provinces for making allowances for the area of the bunds are summarised in Appendix VII.

3.25. *Improvement Suggested.*—It is not always possible to record the area under such temporary bunds accurately. Moreover, a bund is an essential part of a field and is always associated with it. This area is not available for utilization for any other purpose except in cases where seeds are sown on the bunds also, and as such the area may as well be included under the crop. Moreover, it is possible to estimate the approximate allowance that has to be made on account of these bunds.

The question whether the reported area includes or excludes the areas under bunds is important since the estimates of average yield per acre obtained from the random sampling crop-cutting surveys relate to the area excluding the bunds. Thus the acreage figures obtained from a complete enumeration of the survey numbers should be adjusted for the area occupied by the bunds before the estimates of yield obtained by the random sampling surveys are applied to them. It is however necessary to clearly specify this and also indicate the percentage allowance that is to be made on account of the bunds. In case of permanent bunds of the first category, the area should be shown separately in the Khasra Register itself, while the area occupied by temporary bunds could be included in the area reported under crops.

3.26. *Sown and Harvested Areas.*—Another important factor to be considered in the compilation of acreage statistics is whether they should relate to areas sown or to area harvested. Generally speaking, acreage statistics should relate to areas sown and not to area harvested, for, the crop failure, if any, should affect the yield but not the area. In case, however, on account of the failure of the first crop, the field is re-sown with a different crop, the whole area should be entered under the second crop. This is the practice now followed in all the provinces and states in India and should be continued. A rough estimate of the normal percentage of harvested to sown area can be obtained on the basis of sample surveys, in conjunction with crop-cutting experiments.

3.27. *System of Recording Area Sown more than once.*—As regards the recording of areas sown more than once in the same year, such areas are accounted for in the agricultural statistics, the area being counted once each time under the respective crops during the different crop-inspections in the different seasons. The International Rice Commission at its Bangkok Conference has recommended that area sown with rice twice in the same year should be shown separately. Such estimates are not compiled at present in India, although they could easily be collected from the Khasra Register. The idea in compiling these statistics separately is that the average yields of crops taken a second time are considerably lower than the corresponding yields in the single-cropped areas. If this is so, we have to record not only areas under rice followed by rice but also other crops followed by rice and under rice followed by other crops separately. This would involve an additional burden which is not commensurate with the results obtained. The information available at present is sufficient to meet the needs of agricultural statistics in the country. It is therefore felt that the existing practice of recording areas sown more than once is satisfactory and does not need any revision.

3.28. *Statistics of Acreage under Fruit Trees.*—The problems arising in the collection of statistics of acreage under fruits and vegetables are slightly different from those arising in the case of field crops. For, unlike field crops, fruit trees, once planted, stand in the fields for a number of years and give yields at varying rates. Secondly, whereas most of the field crops are sown in survey numbers devoted for the purpose, fruit trees are also grown to a considerable extent on any land suitable for growth, e.g., on the banks of canals or the bunds or on either side of roads or in the backyards of houses, etc. Such fruit-trees are found either in one cluster, in compact areas or are grown scattered here and there. Obviously it is not possible to include the area under scattered trees in the estimates of cropped area given in 'Agricultural Statistics of India'. Thus the annual acreage statistics should relate to the area under fruit trees grown in groves and orchards. In respect of other scattered trees, it will suffice if a complete enumeration of fruit trees is taken once in five years.

SECTION B—YIELD STATISTICS

3.29. *Yield Statistics.*—As regards the statistics of outturn of principal crops which are to be collected annually, the only method is to base them on the crop-cutting experiments carried out on randomly selected fields. The details of the random sampling technique have been described in Chapter I.

These experiments are at present carried out in respect of only a limited number of crops and the need is now to extend the scope of these surveys so as to include all the crops for which estimates of yield are now

prepared and to all the provinces and states including the non-reporting areas. It is understood that the Indian Council of Agricultural Research has recently prepared a five year co-ordinated scheme for the extension of crop-cutting experiments to all principal crops in the provinces. A similar scheme should be prepared in respect of the Indian states and the combined scheme should be put into operation immediately.

3.30. Extension of Scope of Crop Forecasts.—The question of extending the scope of the forecasts of crops issued at present has also been taken up by the Government of India. Since 1944-45 all-India forecasts have been started for jowar, bajra and maize. Barley, gram and ragi have been added to the list from the year 1948-49, and tobacco from the year 1949-50. It is necessary to extend the scope of these crop forecasts to other pulses, other cereals, potatoes, pepper and ginger. The coverage of these forecasts should be made as complete as possible by making efforts to persuade more and more states to begin reporting. Owing to the formation of unions of states, the task of collection of agricultural statistics for these states should be easier.

3.31. Standard Form for Crop Forecasts.—Moreover, at present only the form in which returns of the final forecasts are to be furnished is prescribed in the provinces. The forms in which the returns of crop forecasts are submitted by the primary reporting agencies to the Provincial Government and by the provinces to the Centre should also be standardized. The latter should contain particulars of percentage area irrigated, district-wise condition factor and harvest prices, in addition to the estimates of acreage and yield for the current and previous years as reported at present. A single form should be prescribed (*vide* specimen form Appendix VIII) for all forecasts irrespective of whether they are preliminary or final.

Generally, two to three all-India forecasts are issued in respect of each crop, while five forecasts are issued in respect of wheat and cotton and four in respect of sesamum and jute. Only one forecast is issued in respect of castor seed. The existing forecasts are too many in respect of some crops. What is important is to get at least two accurate reports, one about acreage, as soon as possible after the crop is sown and the other about the output as estimated by the method of crop-cutting experiments, based on random sampling. Additional forecasts may be issued for commercial crops in some cases if found necessary. But the emphasis should be on getting at least two accurate reports rather than half a dozen inaccurate reports. A reduction in the number of forecasts will increase their efficiency in so far as it reduces the burden on the reporters. The number of crop forecasts and the dates fixed for their release should be examined and suitable revisions made accordingly.

3.32. Other Improvements in Crop Yield Statistics.—In addition to the improvements in the method of estimating crop outputs and the extension of scope of crop forecasts, there are other improvements which are necessary in the method of obtaining the normal yields and the condition factor used in the existing official method. Similarly, some preliminary work needs to be undertaken before the scope of the yield statistics is extended to fruits and vegetables. These are discussed below.

3.33. Standardization of normal yields.—Although the final estimates of crop output are to be based on the results of crop-cutting experiments by the random sampling method, still, it is necessary to obtain accurate data regarding the condition factor and the normal yield, for the earlier crop forecasts. As has already been pointed out there is reason to believe

that the normal yields are fixed at a comparatively higher level, and they need revision. One of the objectives of the crop-cutting experiments conducted by the I.C.A.R. is to revise the estimates of normal yields.

The normal yield should be computed as a moving average of the actual average yields per acre obtained by the method of crop-cutting experiments based on the random sampling technique, wherever available, conducted during the preceding 10 years.

3.34. Prescribed Method of Reporting Condition Factor.—The condition factor denotes the condition of the crop in a given season in terms of the normal crop. The anna equivalents of the normals in the different provinces have been given earlier. The condition of the crop may also be expressed as a percentage instead of in the anna notation, as in the U.S.A., but this system is nowhere adopted in India.

Whatever be the unit in which the condition factor is expressed, and whatever be the anna equivalent of normal adopted, it is necessary to adopt the following procedures for obtaining the average condition factor for the various administrative units in the province.

- (i) The patwari should be required to report the condition factor for a crop for each village under his jurisdiction.
- (ii) The average condition factor for the revenue circle or firka should be worked out as the simple average of the condition factors for individual villages in the revenue circle.
- (iii) The average condition factor for a tehsil or a district should be computed as the weighted average of the average estimates for each circle with weights proportional to the areas under the crop in each circle.
- (iv) The district condition factors should be expressed in terms of percentage with the anna equivalent of normal representing 100 in order to ensure comparability, as is done at present.

3.35. The Direct Estimate Method.—In the East Punjab, a different method is followed for estimating the outturn of crops. In this province the tehsildar is required to submit the estimate of the yield per acre for the tehsil as a whole directly in terms of maunds per acre. This method of reporting the yield is called the method of direct estimation. The method of direct estimation is to be preferred to the anna method in as much as the former is a straightforward means of estimating the yields without reference to the normal yields. In regions where the primary reporters are accustomed to reporting in terms of the annawari, there may initially be some difficulty in changing over to direct estimation, but this change is very desirable and should be brought about as rapidly as possible.

3.36. Provincial Condition Factor.—The district outturn may be obtained as the product of the acreage under the crop and the average yield per acre obtained either by the direct estimation method or as the product of the normal yield and the condition factor. The provincial outturn may be obtained as a sum of the individual district outturn figures. Strictly speaking, it is not necessary to define the provincial normal yield or the provincial condition factor. However, in order to obtain a general idea of the condition of the crop in the province as a whole, it is necessary to compute the condition factor for the province. For this purpose the provincial normal yield may be obtained as the moving average of 10 years' provincial average yields; and then the average yield per acre in the current year may be expressed as a percentage of the former to get the provincial condition factor.

3.37. *Correction for Bias.*—The test whether the primary reporter has estimated the condition factor correctly or whether his estimates are biased is that the average of the condition factors taken over a series of years for each district should be equivalent to 100. In some cases, due to inherent bias for under-estimation and pessimism of the primary reporter, the average of the condition factors may fall below 100. This bias may be removed by applying a correction factor which may be defined as $100/C$ where C denotes the average condition factor for the district taken over a series of years. In case the condition factor is unbiased, this ' C ' should be 100. The actual condition factor obtained for each district should be multiplied by this correction factor to give the corrected condition factor. This correction factor is known as "Stuart's Correction Factor" and is applied in Madras even at present. Similar correction factor may be defined in the case of direct estimation method also. This should be applied wherever there is reason to believe that the patwari's figures are biased. It will be particularly necessary to apply this correction when the new normal yields resulting from the present crop-cutting surveys are adopted in place of the existing normals.

3.38. *Method of obtaining Districtwise Outturns.*—The final forecast should be based on the results of crop-cutting surveys which have been found to provide provincial estimates of yield with a high degree of accuracy and estimates for most districts with a reasonable accuracy. Where, however, as in districts with a relatively small acreage under the crop, the sampling error of the crop-cutting estimates is high, it is desirable to utilize supplementary information from eye-estimates of yields on a large number of randomly selected fields. While efficient methods of utilizing this supplementary information will have to be evolved, a simple procedure would be to distribute the total outturn for a division or a group of districts amongst the individual districts in proportion to the products of the area, normal yield and the condition factor for the individual districts.

3.39. *Estimation of Yield of Fruit Trees.*—The extension of the scope of statistics of yield to fruits and vegetables bristles with difficulties. Suitable methods based on random sampling surveys will have to be devised if any reliable statistics of the yield of different fruits and vegetables are to be obtained. It is recommended that the suitable pilot investigation should be undertaken for this purpose.

SECTION C—STATISTICS OF HOLDINGS

3.40. *Statistics of Cultivators' Holdings.*—Information relating to the essential particulars of the cultivators' holdings, *viz.*, the utilization of the area of the holding, the systems of tenancy under which the holding is held, the characteristics of farm population and the numbers of livestock and implements, could be collected by carrying out a quinquennial complete enumeration of cultivators' holdings. Even at present the livestock census is conducted once in five years and if its scope is extended to include a few more items, a complete enumeration of cultivators' holdings can be organized.

3.41. *Sample Survey of Holdings.*—More detailed particulars of holdings can be obtained through a quinquennial sample survey of cultivators' holdings. The background information regarding rural conditions which can be obtained through such surveys will give a correct perspective to the study of the agricultural economy of the province. These surveys should be preceded by suitable pilot investigations in one or two typical districts

in each province. The question of conducting sample surveys of holdings regularly on a quinquennial basis along with the complete enumeration can be taken up only after the results of the pilot enquiry are known.

3.42. *Complete Enumeration of Holdings.*—The points that arise in organizing the quinquennial complete enumeration of cultivators' holdings are as follows:—

- (i) definition of cultivator's holding,
- (ii) items on which information is desired,
- (iii) method of obtaining the information,
- (iv) period of enumeration, and
- (v) agency for the collection of data.

3.43. *Definition of Cultivator's Holding.*—The cultivator's holding* may be defined as all land that is used wholly or partly for agricultural production, and is cultivated alone or with the assistance of others, without regard to ownership, size, or location. It may consist of two or more parcels of land, even if widely separated, provided they form a part of the same operational unit. The holding should include all cultivated land irrespective of whether a particular crop is grown in that area or not. In case of lands held under joint tenancies where the respective shares of the members of such a joint tenancy are not demarcated, the whole joint holding may be taken as a single entity for the purpose of this enumeration.

3.44. *List of Items.*—The following information should be obtained in respect of each cultivator's holding:

- (i) the area of the holding, specifying the different survey numbers or fields constituting it;
- (ii) the utilization of the land in the holding, with the extent under cultivation thereof;
- (iii) the area irrigated and the source of irrigation;
- (iv) the area under different crops and the extent of double cropping;
- (v) the system of tenancy under which the land is cultivated;
- (vi) the number and area of scattered fragments constituting the holding;
- (vii) the principal and subsidiary means of livelihood of the cultivator;
- (viii) the number of persons either wholly or partly dependent on him;
- (ix) the number of whole-time farm servants;
- (x) number of livestock and poultry; and
- (xi) number of agricultural implements and machinery.

3.45. *Method of Collection of Data.*—It is generally not possible to obtain information regarding area under crops by a direct interrogation of the cultivators. Since this information is already available or can be collected from the Khasra Registers, it can be re-tabulated with respect to holdings. Similarly, information relating to land utilization, area irrigated and the systems of tenancy under which the land is held could be obtained from the same Register. The data to be obtained in respect

*All land in the possession of an agricultural family should be considered as a holding.

of each cultivator is thus of two types, firstly, that which could be obtained by retabulation and secondly that which would have to be obtained by a direct interrogation of the cultivators.

3.46. *Preparation of List of Holdings.*—The next task is to prepare a list of cultivators' holdings for each village. In order to facilitate the retabulation of data from the Khasra Register, the list of holdings may be prepared from the same Register in the revised form for which, the name of the cultivator of each individual survey number is sought to be given. It is not necessary that all the survey numbers in a village should be cultivated by the farmers resident in the village; it may happen that some of the cultivators resident in the village cultivate lands in other villages also. The reclassification of data from the Khasra Register of one village will not by itself give complete information in respect of all holdings. It is therefore desirable to prepare and maintain a list of holdings which are scattered in two or more villages, as is already being done in some provinces. Thus complete information regarding the area under crops and types of tenancies can be obtained from the Khasra Register, the accuracy of which may be verified by a reference made to the cultivator, at the time of complete enumeration.

To the list of cultivators' holdings prepared from the Khasra, may be added, another list of non-cultivating owners of cattle, in drawing up which the permanent house numbers prepared for the population census may be utilized.

After the preparation of the list of holdings, the patwari will visit each individual cultivator and enquire from him the particulars regarding his principal and subsidiary means of livelihood, members of house hold, livestock, poultry, etc. and fill in the prescribed form the details of which are discussed in Chapter VII.

3.47. *Period of Enumeration.*—With respect to the period of enumeration, since the cultivator's holding is not constituted till the principal crop seasons are over in each agricultural year, the enumeration can take place only at the end of the last harvest. For instance, by the time of the livestock census *i.e.* during January, it is likely that the tenants may not have decided as to the land they would take up for cultivation with spring or summer crops. A complete picture of the economy of the holding can only be had at the end of the agricultural year. Moreover the retabulation of data from the Khasra Register can be done only during or after the last crop inspection of the year. Thus the enumeration of the cultivators' holdings should be done by about the end of May. The actual work of house-to-house enumeration should begin immediately after the retabulation of data from the Khasra Register is completed *i.e.* about the middle of May. The patwari is expected to complete the enumeration in a fortnight's time. On the 31st of May, he should check up whether any alterations are necessary in the entries already made. The idea of the census implies that the data should relate to the position as on the date of the census so that the possibility of double counting may be avoided.

3.48. *Agency for Collection.*—The primary reporting agencies will be the patwaris in the temporarily settled provinces. In the permanently settled areas, the special reporting staff appointed for the complete enumeration of survey numbers should be employed for the enumeration holdings also. It may be added that in these latter areas, the livestock census is at present being conducted by the presidents of Panchayat Union

Boards. Since however part of the information is to be obtained from the Khasra Form it would be advantageous to have a single agency *viz.* the special reporting staff for the enumeration of holdings and the survey numbers. The co-operation of the Panchayat Union Boards should be secured for this work.

3.49. *No Need for a Separate Livestock Census.*—As livestock is one of the essential characteristics of the holding and is always associated with it, any complete enumeration of holdings implies the enumeration of the livestock also. Thus the present livestock census should completely be integrated and conducted as part of the quinquennial census of holdings. In the case of non-cultivating owners of cattle whether in rural or in urban areas, only those items which form part of the cattle census need to be enumerated. The data in the urban census may be collected through the existing agencies of conservancy jamadars and should be checked by the sanitary inspectors of each municipality or the urban panchayat union. Similar agencies may be employed in the Cantonment and other areas.

SECTION D—MISCELLANEOUS AGRICULTURAL STATISTICS

3.50. *Miscellaneous Agricultural Statistics.*—The collection of miscellaneous agricultural statistics should also be organized on the same principles as outlined in paragraph 3.2. The statistics of harvest prices and wages of agricultural labourers should be collected annually on the basis of periodical returns received from representative villages while the statistics of animal husbandry produce like milk and the production of eggs should be obtained on the basis of quinquennial sample surveys. Similarly, additional particulars of acreages under improved varieties of crops and the extent of the use of fertilizers and manures should be obtained annually as ancillary information from the annual crop-cutting sample surveys. The other sample surveys that may be necessary are in respect of costs of production of principal crops, utilization of agricultural produce, rural indebtedness and assessment of G.M.F. campaign. The problems involved in the collection of each of these statistics are described below.

3.51. *System of Reporting Harvest Prices.*—As regards the system of collecting harvest prices neither the present definition nor the methods adopted for the collection are uniform in all the provinces. In some provinces the harvest prices are based on wholesale prices, while in others they represent the average retail prices during the harvest period. The harvest price of a commodity may be defined as the average wholesale price at which the commodity is disposed of by the producer to the wholesaler at the village-site during the specified harvest period. The following procedure is suggested for systematizing the collection and compilation of these statistics.

- (i) A requisite number of representative villages may be selected in each district. In each selected village the prices at which the commodity is sold by the producer may be recorded in a standard form (*Vide* specimen form Appendix IX) on a specified day in each week, during the harvest time. If the commodity is not sold at the village-site, the price quoted may relate to the prevailing price at the nearest market minus the cost of transport from the village to the market.
- (ii) Harvest prices when they are viewed as integral part of agricultural statistics, should be collected through the normal

agency employed for the collection of statistics of area and yield.

- (iii) The existence of different varieties and qualities with a wide range in price variation make the task of giving a single harvest price for a commodity for the whole province, difficult. In each district, however, it is possible to determine a particular variety which is grown to the maximum extent and this variety may be adopted for quoting the harvest prices.
- (iv) It is also necessary to fix the harvest period for each crop in each tehsil. Generally, a period of 6 to 8 weeks after the completion of the harvest may be taken as the period of harvest.
- (v) At present the median average of the district harvest prices is taken to represent the provincial harvest price. This method of averaging should be replaced by the method of weighted average with the district production figures for the current year as weights. The weekly average price for the district may be obtained as a simple average of the tehsil prices which in turn may be obtained as a simple average of the village prices. A simple average of the weekly district prices taken over the season will give the single annual harvest price for the district as a whole.

3.52. *Publication of Harvest Prices.*—At present, the harvest prices are published in the Provincial Season and Crop Reports and in 'Agricultural Statistics of India' Vol. I. The number of crops for which such prices are published also varies from province to province. It is therefore suggested that the harvest prices should be collected in respect of all the forecast crops and the prices may be included in the final forecast. Such a harvest price multiplied by the production figure will give an estimate of the contribution of that particular commodity to the National Agricultural Income.

3.53. *Statistics of Wages of Agricultural Labour.*—As regards statistics of wages of agricultural labour, it has already been mentioned that no statistics are at present collected except the scanty information obtained in the quinquennial wage censuses carried out in some provinces. Agricultural wages constitute a major item in the cost of production of crops and it is essential to have an idea of the actual variations in this item in order to assess the trends in agricultural costs. It is necessary, therefore that statistics of wages of agricultural labour prevailing in selected representative villages should be collected on a fortnightly basis.

Such information on the prevailing wage rates should be collected from each district of the province or from at least one district in each of the administrative or geographical divisions into which the province is divided. In each district, a number of villages may be selected so as to represent the wages and general agricultural conditions of the district. The wages reported should relate to unskilled casual labour employed on a daily wage rate and paid either in kind or in cash in the selected villages. The most common wage rate prevailing in the village during the fortnight should be recorded in a standard return prescribed for the purpose (*Vide* specimen form, Appendix X). The cash wages as well as the money equivalent of wages in kind or perquisites and their total, need to be shown separately. The wages of men, women and children should also be recorded separately. Moreover, since the wages paid vary with the type

of work, it will be necessary to specify the nature of work to which the reported wage relates. For this purpose, the agricultural labourers may be divided broadly into:

- (i) field labourers,
- (ii) herdsmen,
- (iii) other agricultural labourers. It will also be useful to give the type of agricultural operation to which the reported wage relates.

These data may be collected by employing suitable agencies in the different provinces and states. For instance, the data may be recorded by the patwaris of the selected villages in the temporarily settled provinces, and the presidents of the local Panchayat Boards in the permanently settled provinces.

3.54. *Statistics of Yield of Milk and Eggs*—With regard to animal husbandry products, estimates of production of milk and eggs cannot be obtained by the method of complete enumeration by a direct interrogation of each cultivator either on the basis of estimated annual yield or on the basis of the quantity of milk yielded and the number of eggs laid on a particular day. For, on the one hand, the cultivator cannot give an annual estimate with any degree of reliability and on the other, in view of the large amount of seasonal variation in the daily yields, in the length of lactation period and in the number of animals in milk in each month, it is not possible to estimate the annual yields of milk on the basis of the total yield obtained as on a day. Similar is the case with the estimation of production of eggs. The method of estimating the yield as a product of known average yield of each milk-yielding breeds of cattle and the number of animals of the breed will not be generally applicable because not only the cattle are of heterogeneous breeds, but their feeding conditions also vary.

The only reliable method is to base them on the method of random sampling. The technique of random sampling has not yet been developed with regard to its application in the problem of estimation of yield of milk under Indian conditions. Thus it is necessary to study, by conducting a pilot investigation, the variation in milk yields before the plan of sampling could be decided upon for the all-India surveys. Suitable pilot investigation should be undertaken taking into account the previous experience, if any, available in this connection. Similar surveys should be conducted in respect of the estimation of production of eggs.

3.55. *Ancillary Statistics*.—In order to assess developments in agricultural techniques, it is necessary to have reliable estimates of the following:—

- (1) Areas under
 - (a) improved varieties of crops,
 - (b) different types of manures and fertilizers.
- (2) Percentage of harvested to sown areas.
- (3) Rotational practices.

As the crop-cutting surveys are based on the survey number as the unit, it is possible to get additional information regarding agricultural practices in India on a sampling basis, by suitably enlarging the scope of the surveys.

Previous experience has shown that the data regarding item '1' can be collected without much extra cost, from the information already

collected in the first return for the crop-cutting surveys. The return can be so designed as to provide for the collection of data on the other two items also. The precision with which the estimates are determined depends however, upon the number of samples taken.

3.56. *Enquiry into Costs of Production of Principal Crops and Rural Costs of Living.*—In view of the urgent need of data on cost of production for fixation of prices and grant of subsidies, enquiries into costs of production of crops and rural costs of living, based on the method of random sampling should be carried out immediately on an all-India scale. The data should be collected on the basis of continuous study of farm accounts with the help of specially appointed whole-time trained investigators. Since the cost of production per maund depends also on the yield per acre, the season has its influence on the cost. Such enquiries therefore should be conducted over a period of three years so that an average estimate of cost over the three years also covers usually the most important crop rotations, thus giving a complete picture of the economy of the holding. Such enquiries should be repeated once in ten years and in the mean time annual variations in the costs should be obtained taking into account the variations in each individual constituent item of cost, on the basis of available prices, wages and other data. The experience of work previously done by the I.C.A.R. and the I.S.I. should be pooled for devising a suitable technique for cost of production surveys. It is understood that the preparation of such schemes is already engaging the attention of the I.C.A.R. and the various Commodity Committees.

3.57. *Utilization of Agricultural Produce.*—Information regarding the quantities of total agricultural production utilized for various purposes *i.e.* for seed, for consumption on the farm as fodder, quantities retained by the farmer for his personal use, quantities used for barter, should be obtained either independently or as part of the surveys on costs of production and costs of living. It is necessary to have an exact idea of the marketable surplus of each of the agricultural commodities so that the targets of procurement fixed in respect of the food grains could be worked out more accurately and enforced more strictly. It will be noted that the information presently available relates to that obtained during the marketing surveys:

3.58. *Rural Indebtedness Survey.*—The objectives of the rural agricultural indebtedness survey are:

- (i) to estimate the size, composition and distribution of the total indebtedness of the agriculturists,
- (ii) to examine the trends in each of these characteristics, and
- (iii) to examine the extent to which each of them has affected productivity.

A properly planned enquiry into rural indebtedness should be based on principles of random sampling. While planning these surveys the work done by the I.S.I. in 1934-35 in collaboration with the Bengal Board of Economic Inquiry and other surveys carried out in 1944-45, and 1946-47 in Bengal should also be taken into account. The method followed in the enquiry into the rural indebtedness carried out in Madras in 1946 is as follows:—

The families in each selected village were divided into five strata consisting of three classes of land holders, tenants and landless labourers. Land holders were divided into three classes on the basis of area of their holdings. Within each stratum, one fifth of the families were selected for 130 M. of Agri.

investigation. Similar surveys should be conducted in all the provinces and states at an early date.

3.59. *Assessment of Achievements of GMF Campaign.*—The GMF campaign aims at increasing the total food production of the country by undertaking extensive and intensive cultivation schemes. While the increase in the acreage under food grains could be assessed from the existing area statistics, the current official methods of estimating the routine yield statistics will not enable an accurate assessment of the achievements of the GMF campaign in the direction of intensive cultivation.

The method at present followed in assessing the additional food production resulting from the various intensive cultivation schemes of GMF aid is based on certain assumptions which may or may not be true in actual practice. For instance, the extra yield of foodgrains resulting from the distribution of fertilizers is estimated on the basis of the expected rate of increase in yield per acre on the application of a specified quantity of fertilizers. In the conditions obtaining in the cultivator's field, this additional yield might not materialise due to a variety of factors. At present even the detailed information as regards the exact areas where GMF schemes are operating is not available.

The additional production likely to result from a given measure or combination of measures taken in the GMF aid schemes can be assessed accurately by conducting crop-cutting experiments, on a statistically sound basis on fields which are in receipt of different types of GMF aid as well as those which are not in receipt of such aid. The procedure adopted for crop-cutting experiments for determining average yield may be modified to give a suitable statistical design for this survey.

It is understood that a scheme for conducting properly planned surveys for assessing the achievements of the GMF campaign is being prepared by the I.C.A.R. It is recommended that this scheme should receive careful and immediate consideration of Government.

In order to properly utilize the results of these surveys, it is necessary to link the statistics of additional yield obtained as a result of the GMF measures with the procurement demand on the cultivators. The collection and compilation of detailed statistics such as lists of beneficiaries from GMF measures, the extent of area to which these measures are applied, the amounts of manures, fertilizers, improved seed and other aids distributed should be properly organized.

3.60. *Other Surveys.*—There are also other surveys, viz. diet and nutritional surveys, designed to give data on food requirements of the population, the composition of diets and the proportion of vegetarians and non-vegetarians, surveys into the conditions of agricultural labour and problems of rural transport, etc., which also are of topical interest, but as these enquiries are not purely agricultural in character, these problems, can be properly considered only by a joint Committee of Statisticians and other experts representing the various Departments concerned.

SECTION E—CONCLUSION

3.61. *Standard Forms.*—The various returns at present filled in by the reporting agencies need to be carefully examined and standard basic forms evolved which will provide all the information contained in the several forms at present in use, but in a correlated manner. The basic returns

will naturally relate to the routine items of information to be obtained through a complete enumeration. As the principal complete enumeration surveys are to be conducted annually and quinquennially it is necessary to evolve two standard forms—one which is to be filled in every year and the other once in five years. These two forms should give for each survey number and each cultivator's holding respectively the names of the owner and the cultivator, the systems of tenure and tenancy under which land is held and cultivated, the number of members of the household of the cultivator, the distribution of acreage under crops, the number of trees, the sources of irrigation, the number of cattle and agricultural implements and any other details that may be necessary. The information obtained with respect to each survey number can be retabulated with respect to each cultivator and the two forms can be made inter-dependent. Once the two basic forms of returns are standardized, all forms can easily be derived from these by retabulation, leading to an economy of labour and cost in the aggregate. **These standard forms are discussed in Chapter VII.**

3.62. *Five-fold Enquiries.*—The collection of data on acreage, yield and other statistics on the lines indicated in sections A to D will involve the following steps:—

- (A) The existing forms which are annually filled for the complete enumeration of survey numbers should be standardized and if necessary expanded to include more items and extended to all areas.
- (B) Random sample surveys should be conducted annually for the estimation of crop yields. The checking and supervision of complete enumeration statistics should be rationalized, by introducing the principle of random sampling.
- (C) A complete enumeration of cultivators' holdings should be conducted giving all particulars of each holding including livestock, implements irrigation, etc., once in five years.
- (D) A random sample survey of agricultural holdings should be carried out along with complete enumeration for a more intensive study.
- (E) Other sample surveys for giving the information on specific items of miscellaneous agricultural statistics should be conducted according to the relative priority and at necessary intervals.

3.63. *Steps already Taken.*—It is understood that the Directorate of Economics and Statistics in the Ministry of Agriculture has already taken the initiative in recommending improvements of agricultural statistics more or less on these lines to the Provincial and State Governments for their consideration and adoption. It appears that in respect of some items, action has already been finalized, **while in respect of others, the questions are still under consideration.** It is recommended that a continuous effort should be made to ensure that these recommendations are implemented.

CHAPTER IV

ORGANIZATION FOR THE COLLECTION OF AGRICULTURAL STATISTICS

4.1. *Collection of Statistics Means to an End.*—The collection of statistical data, as will be readily agreed, is not an end itself but only a means for enabling the formulation of governmental policy and the adoption of appropriate administrative measures, whether in day-to-day administration or in meeting emergencies. The accuracy of the data collected and the validity of the conclusions drawn therefrom depend to a large extent on the efficiency with which the various agencies for the primary collection, supervision at the different levels, compilation and analysis perform their respective functions. The pattern of organization that is visualised for the collection of agricultural statistics at the different levels is discussed below.

4.2. *Primary Reporting Agencies.*—With respect to the primary reporting and subsequent supervisory agencies, the existing position in the different provinces and states has already been described. It has been suggested that a separate crop reporting agency should be established for the purpose of collecting agricultural statistics. *Prima facie*, financial consideration involved in the appointment of whole-time crop reporters on the scale necessary to enable the collection of agricultural statistics by field-to-field enumeration, in the 5 lakh villages in India, will rule this question outside the realm of practicability. Even if for a moment it is suggested that these crop reporters should be entrusted with the collection of all statistics, not necessarily restricted to agricultural statistics only, even then, it will not be an improvement over the existing arrangement. For, the patwari being the last link in the administrative machinery, is a man of importance and standing in the village and he alone can get the statistics out of the illiterate and often suspicious population. Even the special investigators engaged on *ad hoc* surveys find it difficult to get any information from the villagers without the co-operation of the patwari. It may be noted that the collection of agricultural statistics is organically related to the collection of land revenue in the temporarily settled provinces and it is not desirable to disturb the present arrangement. Thus the primary data should be collected through the patwaris in the temporarily settled provinces and through special staff in the permanently settled provinces. Similar agencies should be set up in the Indian states also, where they do not exist at present.

4.3. *Jurisdiction of Patwari.*—We have already mentioned that the jurisdiction of the patwari is often too large. In order to cope with the increased burden of work, the jurisdiction of the patwari should be reduced to manageable dimensions. In the U. P., the following limits are prescribed for each patwari circle: total area, 2,500 acres; cultivated area, 1,500 acres; number of plots about 4,000; number of holdings 1,000. In the East Punjab the respective averages are 8,000 acres of total area 3,300 acres of cultivated area, 4,400 survey numbers and 1,200 khatauni holdings. It is felt that this charge is excessive and that it is not reasonable to expect the patwari to cover more than two to three thousand survey (or Khasra numbers in three to four villages on an average during the period available to him for the harvest inspection. The size of the patwari circle should

be reduced and adjusted accordingly. The actual limits in each area are however to be fixed bearing in mind the geographical nature of the terrain, the average size of a survey number, the nature of cropping, etc. by the Provincial Governments concerned.

4.4. *Jurisdiction of Special Reporting Staff.*—The special staff recruited for reporting agricultural statistics in permanently settled areas, do not have revenue duties and can be engaged whole-time on the collection of agricultural statistics. The jurisdiction of each amin (patwari) may therefore extend to about 10 to 12 villages of average size.

Consequent upon the creation of the kramchari staff for the Zamindari abolition work, each kramchari in Bihar has about 10 villages under his jurisdiction. The adequacy or otherwise of this agency will depend to a very large extent on the additional duties imposed upon the patwari in connection with the Zamindari abolition work and the time available for the reporting of agricultural statistics.

In Orissa, however, the existing complete enumeration staff is wholly inadequate since the jurisdiction of each amin exceeds 120 villages. The amin will not even have time to visit each of the villages once, not to speak of the enumeration of crops. The method of completely enumerating half the number of villages and recording only the changes in cultivation in the other half now adopted in Orissa as a consequence of reduction in staff, is unreliable and cannot be expected to give accurate data. This is a retrograde step when the complete enumeration scheme has been in operation for five years. The only remedy is to enlarge the primary enumerating staff in Orissa.

In West Bengal, the services of the union agricultural assistants should be engaged for the collection of acreage statistics by the method of complete enumeration as a permanent measure.

4.5. *Employment of Special Staff in Areas where no Reporting Agency Exists.*—In the surveyed areas of the temporarily settled provinces where no primary reporting agencies exist, it is necessary to employ special staff for the collection of agricultural statistics. For this purpose one patwari should be appointed in charge of about 10 villages as in Bihar. At present there does not exist any revenue agency in these areas because the system of land revenue assessment does not warrant their employment. There is, however, a tendency towards a revision of the revenue policy in favour of temporary revenue settlement and peasant proprietorship all over India. Various schemes are under the consideration of the Provincial and State Governments for the implementation of these proposals. The *ad hoc* agency now employed should be absorbed in the Revenue Department.

4.6. *Special Staff to be made Permanent.*—The special agencies in Bihar and Orissa have been created only recently and they are employed on a temporary basis, extension of their services being granted yearly or even half-yearly. The uncertain nature of the tenure of employment is bound to react adversely on the efficiency of their work and hence it is necessary that they should be confirmed immediately.

4.7. *Number of Crop Inspections.*—In order that the data collected on the basis of field-to-field inspection be accurate, the fields should be visited when the crops are standing on the field. This means that if there are two or three crop seasons, the patwari should make at least two or three inspections in the year. At present the number of harvest inspections is two in the East Punjab and Bombay, three in the U. P., one in the C. P. and Berar and twelve in Madras. The need for a monthly crop

inspection in Madras is probably due to the absence of well-defined crop seasons arising out of the prevailing climatic and crop conditions. But even then, it may not be necessary to have monthly inspections, since the crops once sown will be in the field at least for three months, and the inspection may be done at any time during this period. Thus there should be a smaller number of crop inspections, but each one of them should be more thorough than at present, if the resulting statistics are to be reliable.

Further, the present crop inspection is completed in about 4 to 6 weeks time, just before the harvest and is hence called the harvest inspection. The data furnished by the reporting agencies for the area returns of earlier forecasts are based on guess work, since no crop inspection is done by that time. In order to collect reliable estimates of acreage even for the first forecast, it is necessary that the reported figures should be based on more objective procedures. For this purpose, the patwari should make a complete crop inspection in randomly selected villages in his jurisdiction and base his reports on the data so obtained. Alternatively, the patwari may call all the cultivators in his jurisdiction and obtain information as to the crops each has sown on his fields. The patwari can, with the Khasra Register and the field map before him, then estimate the acreages sown, with greater accuracy. It is also possible to collect data on the amount of seed sown by the cultivator so as to provide a rough check over the estimates of area so obtained.

Great importance should be attached to having correct estimates of crop acreages as early as possible in the season and correct estimates of production as soon after the harvest as possible.

4.8. *Training of Patwaris.*—Although the patwaris receive training in the revenue and land records work, they do not acquire the requisite practical training for recording agricultural statistics accurately. The accurate classification of land into its various uses, or the estimation of area under each of the constituents of a crop-mixture, requires intensive practical training, if the patwaris are to do their work reliably. The primary reporting agencies should be adequately trained in the intricacies of classification of agricultural statistics and the methods of recording the areas accurately, with special reference to the methods of recording area under mixed crops or estimating the area of uncultivated patches in a cultivated field, or the area occupied by the bunds and the compilation of the data from the basic forms into village abstracts. It is desirable that the scope of the patwaris training in relation to agricultural statistics should be adequately enlarged to meet the above requirements, in consultation with the Provincial Agricultural Statistician.

4.9. *Improvements in the Method of Supervision.*—The method of supervision and checking adopted by the superior officers also requires rationalization. The defects in the existing methods have already been described in Chapter II where the need for random checking has been suggested. Even at present, the kanungo is expected to check about 25 per cent. of the work of the patwari and the tehsildar is expected to supervise about 5 per cent. of the work. If on the other hand, the number of villages to be visited and the number of fields to be checked are selected at random, it may be possible to reduce the total amount of supervision and at the same time increase its efficiency. The additional advantage of the random sampling method is that it furnishes an estimate of the reliability of the figures. A pilot survey should be undertaken to determine the size of the sample selected, the sampling procedures adopted and other technical details.

4.10. *Qualifications for the Recruitment of Patwari.*—The minimum educational qualifications of the patwari should also be raised. He should be literate and should have a fair knowledge of arithmetic. He should reside within the patwari circle and should not depute any other person for the collection of agricultural statistics. He should be appointed on a regular monthly salary basis wherever possible.

4.11. *Steps Necessary to Remove Defects in Primary Reporting Agency.*—Thus in order to remove the defects of the primary reporting agency and improve the accuracy of the statistics at present collected by them, the following steps should be taken:—

- (i) the jurisdiction of the patwari (or the amin) should be reduced wherever it is excessive;
- (ii) there should be less number of crop inspections but they should be more thorough;
- (iii) the primary reporting agencies should be trained in the collection of agricultural statistics,
- (iv) the methods of random sampling should be adopted for checking the work of the patwaris and kanungos; and
- (v) the qualifications and the conditions of employment of patwaris should be revised.

4.12. *Supervision by Kanungos (or Inspectors).*—The returns submitted by the primary agency will have to be checked at successive stages before they are consolidated and compiled. At present, the kanungos (or the revenue inspectors) in charge of revenue circles consisting of a group of about 100 villages are expected to satisfy themselves about the accuracy and the completeness of the returns submitted by the patwari. They are also expected to check up the entries in the field register by actual inspection during their periodical visits to each village. But since the kanungos are also burdened with other multi-farious duties, they do not find time to check up the data by an actual inspection of the fields. It will therefore be necessary to reduce the charge of the kanungos simultaneously with the reduction in the charge of patwaris.

These kanungos will, in addition to supervising the work of the patwaris, do the work of primary reporting also in respect of certain items on which the patwaris will not be in a position to give the information with accuracy. For instance, in the crop-cutting surveys based on the random sampling technique for the estimation of crop yields, the field work is to be done by the kanungos as a matter of routine. Even for the other random sample surveys, the kanungos should be trained and utilised for the field work. The advantages of employing the routine agencies for work in sampling surveys instead of appointing *ad hoc* field staff are obvious. Similar agencies of inspectors should be employed in the areas where special staff are engaged for reporting agricultural statistics to supervise their work.

4.13. *Supervision at Tehsil and District Levels.*—Corresponding to the reduction of the charges of patwaris and kanungos, provision for increased supervision of their work at tehsil and district levels is necessary. This need can be met by strengthening the present supervisory staff by the appointment of additional staff of appropriate grades at the tehsil and district levels *e.g.*, naib-tehsildars or assistant superintendents of land records in the tehsils and sub-divisional officers or superintendents of land records in the districts.

4.14. *Central Agency for Checking.*—In view of the growing importance assumed by agricultural statistics in planning the food policy, the Central Government should also create a suitable machinery which will exercise an independent check on the collection of agricultural statistics in the provinces and states as recommended by the Provincial Food Ministers' Conference. This will not only serve to exercise a wholesome influence on the work of the primary agency, but will also secure a more adequate and effective supervision by the provincial supervisory agencies.

4.15. *Tabulation is Decentralized at Present.*—Next in importance to supervision comes the question of tabulation of the data. The immensity of the volume of tabulation of the data on agricultural statistics is not realized, as the consolidation is done at various stages. Thus the patwari himself classifies the figures from the basic forms in the prescribed forms of village abstracts for each village and sends only the consolidated returns to his superior officer *viz.* the kanungo. The kanungo consolidates the returns for the different villages under his jurisdiction and sends the consolidated returns for the circle to the tehsildar. The returns for the circles and tehsils are consolidated at the tehsil and district stages before the final figures for the province are worked out. Thus the tabulation of agricultural statistics is decentralized.

4.16. *Centralized Versus Decentralized Tabulation.*—The decentralization of the tabulation has got its own disadvantages. Firstly, the passing through of the various stages necessarily involves a lot of avoidable waste of time, thus leading ultimately to the enormous delays in the publication of current agricultural statistics. Secondly, the scope for error in the consolidation at various stages is also large; since two kinds of errors are likely to crop in *viz.* errors in posting and copying the data from returns to registers and errors in computation and calculation unaided by mechanical devices. The principal advantage in this decentralized system is that the employment of a large computational staff at the centre is not necessary.

4.17. *Use of Mechanical Devices.*—If the tabulation is centralized then it is possible to utilize the mechanical devices of tabulation for consolidating the returns of agricultural statistics. For instance, the data collected in respect of each holding or village could be consolidated with the help of the Hollerith Equipment. The data can be transferred to punched cards at the district headquarters, with the help of Hollerith mechanical key punches and verifiers. The punched cards may be sorted and tabulated with the help of Hollerith sorters and tabulators. All the Provincial and State Governments may not, however, be in a position to adopt this method immediately. A beginning in this direction has already been made in the Bombay Province and if this experiment proves successful, mechanical tabulation may be extended to other areas also. Even otherwise, the district offices should be equipped with calculating machines to aid the tabulation of agricultural statistics.

4.18. *Existing Organization at the Provincial Headquarters.*—With respect to the organization at the provincial headquarters, the existing patterns for the compilation of statistics can be divided into two categories. In the first category are the provinces where Central Bureaus of Economics and Statistics have been established under the charge of an Economic Adviser, or a Director of Economics and Statistics. Then there are other provinces where no such centralized agencies exist and where the collection of statistics is performed by the Departments concerned. Although Central Bureaus exist in the U.P., Bombay, West Bengal, Orissa, Madras,

Assam and recently in the East Punjab, it is only in Madras that the compilation of agricultural statistics forms part of the functions of the Bureau. In the U. P., Bombay and West Bengal, the Statistician to the Department of Agriculture is responsible for the compilation of agricultural statistics. In C.P. and Berar and Bihar no such Central Bureaus exist, but there are Statisticians in the Department of Land Records and Revenue. It is only in Assam and the East Punjab, that there are no Statisticians either in the Department of Agriculture or the Department of Revenue.

4.19. *Departments concerned with Agricultural Statistics in the Provinces.*—Even the Departments which are concerned with the compilation of agricultural statistics also are not the same in all the provinces. In some provinces the compilation is done in the Department of Revenue or Land Records; while in others it is the responsibility of the Department of Agriculture. Since the collection of data is done through the revenue agency, as incidental to the collection of revenue, the compilation is also done in the Revenue or Land Records Departments in the first set of provinces. In the other, the data is compiled in the Department which has the administrative responsibility for action in that sphere and thus needs it most *i.e.* the Department of Agriculture. This diversity of practice is partly explained by the fact that compilation of agricultural statistics is a provincial responsibility.

4.20. *Provincial Agricultural Statisticians.*—We are of opinion that in each province and state there should be an Agricultural Statistician of a fairly senior rank who should have the following duties:

- (i) compilation and publication of routine data;
- (ii) conducting sample surveys routine, as well as *ad hoc*; and
- (iii) analysis of agricultural experiments.

Where such statistical officers are not already in existence, they should be appointed immediately, so that the various measures of improvements of agricultural statistics are pursued and implemented. We also suggest that there should be an Economist in the Agricultural Department to advise the Provincial Government on matter of agricultural policy. These officers will maintain the liaison between the Central and the Provincial Governments on all matters concerning agricultural statistics, so that greater co-ordination can be achieved in the organization of agricultural statistics in the different provinces and states. As an effective method of ensuring this co-ordination we suggest that a Standing Committee of Central, Provincial and State Agricultural Statisticians should be set up.

4.21. *Organization for Agricultural Statistics at the Centre.*—At the Centre, all the work relating to agricultural statistics should be under the administrative control of the Ministry of Agriculture, so that the data collected will be of direct utility in framing agricultural policy. It is only by the collection of data relating to each sector of national economy, its appropriate tabulation and rational interpretation that light can be thrown upon the gaps that exist, the dark-spots that call for remedial measures and the lines on which action should be directed. The time lag between the collection of the data and the discovery of directions in which remedial measures are taken can also thereby be reduced to a minimum. The organization in the Ministry of Agriculture should keep in touch with the Provincial Agricultural Statistician and maintain effective co-ordination of work between the centre and the provinces.

4.22. *Functions of the Central Organization*—The functions of the organization at the Centre may broadly be classified into two categories—viz. administrative and technical. The former comprise of (i) standardization of compilation procedures, (ii) routine collection and compilation of data, (iii) their analysis and interpretation, and (iv) advice on policy. The latter comprise of (i) research in statistical techniques and their application to agricultural problems, and (ii) training in agricultural statistics. The technical personnel and organization required for these two types of organizations are different and hence two separate organizations are necessary under the Ministry of Agriculture. This division accords with the existing pattern of organization in the Central Ministry of Agriculture, the Directorate of Economics and Statistics under the Economic and Statistical Adviser and the Statistical Branch of the Indian Council of Agricultural Research under the Statistical Adviser performing the administrative and technical functions respectively.

4.23. *Need for a Central Co-ordinating Committee for Statistics*.—While separate organizations are necessary under each Ministry for catering to its specialized requirements it is desirable that the work of these organizations be co-ordinated by a Standing Committee of the Heads of the different organizations. Such a Committee has already been set up at the Centre. Similar arrangements for co-ordination of the statistical work of the different Departments in the provinces are suggested.

4.24. *Role of Cultivator in Crop-reporting*.—Besides the existing official agencies for the collection of agricultural statistics, it is desirable that the voluntary services of cultivators should be enlisted for reporting agricultural statistics. In India the cultivator himself does not play any role in the collection of agricultural statistics, while in the United States, U. K. and other Western countries, it is the farmers themselves who assist in the collection of statistics. The time has now come when in India also, the villagers themselves should provide the foundation of the crop reporting service assisted by a trained patwari. The size of the country and of the population make the voluntary co-operation on the part of the villagers essential for successful reporting of statistics. It is true that most of the villagers are illiterate but even then they can co-operate with the patwari by supplying him information when called upon to do so and by assisting him in crop inspection and other work.

4.25. *Non-official Crop-reporting Agency*.—What is necessary is to create a consciousness amongst the cultivators that the maintenance and supply of statistical information is ultimately for his own good and has a direct bearing on the efficiency of his own occupation. At the moment, the supply of statistics is linked up in his mind only with the payment of revenue and naturally he cannot be expected to stir up any great enthusiasm for the purpose. Once he realises that the supply of statistics will lead to more assistance from the Government in the form of supply of materials and technical advice, he will quickly respond. It is not suggested that the non-official agency should replace the normal administrative machinery in the collection of agricultural statistics, but a beginning should be made to secure the co-operation of the village communities through the newly established janapadas and gaon panchayats in this task.

CHAPTER V

COLLECTION OF DATA FOR THE FAO CENSUS

5.1. *Scope of the FAO Census defined by the List of Items.*—The implementation of the proposals for the improvement of agricultural statistics and the standardization of the methods of collection described in the previous chapters will automatically lead to the collection of data required for the FAO census, the scope of which has been defined by the list of items proposed for inclusion in the questionnaire suggested by them. Since the FAO census is conceived of as a direct and complete enumeration of individual holdings, the list of items forwarded by the FAO relates to the essential characteristics of the individual holdings. As it was not possible to lay down a uniform questionnaire to be used by all the Governments, the FAO has suggested only the list of items for which internationally comparable statistics are expected. These items are given in the short and expanded lists of census items given in Parts A and B of the programme forwarded by the FAO, (Appendix III).

5.2. *List of Items Proposed for the Census.*—Part A, viz. short list, includes those items about which data are desired from all countries while part B, the expanded list is more inclusive. The short list of items on which data is desired from all countries by the FAO covers (I) tenure, (II) land utilization, (III) agricultural population, (IV) crops, (V) power and (VI) livestock and poultry. In the expanded list the scope of each of these items is slightly enlarged and a few other items are added.

The other items added in part B are (1) employment in agricultural work connected with the holding, (2) agricultural technology, (3) fertilizers and soil dressings, (4) irrigation and drainage, (5) fragmentation, and (6) wood and fisheries products.

5.3. *Statistics of Production.*—It will be seen that the volume of agricultural production is not included in either part A or part B of the lists of recommended items. Nevertheless, FAO has recommended that every effort should be made to obtain annual estimates of production of individual crops. We endorse the recommendation and suggest that the scope of the present crop-cutting surveys should be extended to cover all provinces and states and all principal crops, as quickly as possible.

Livestock products was included as an item in the original minimum programme but this has been deleted from the scope of the revised lists of items.

5.4. *Method proposed for the Census.*—Although the FAO Census is conceived of as a direct enumeration of individual holdings, the adoption of other means of obtaining the information wherever desirable or necessary, is not ruled out. In fact, in the undeveloped countries, where the majority of the inhabitants of such areas are illiterate, the populations are scattered and unstable and the areas to be surveyed vast, neither the questionnaire method nor the method of enumeration by official enumerators is practicable. In India too, it is not possible to obtain the data regarding area under crops by a direct enumeration of individual holdings by the

questionnaire method. For, in India, the holdings are so numerous, fragmented and scattered and held under such complicated tenancies that the method of complete enumeration of holdings will not be feasible. The concept of an individual fixed holding which is usually met with in America and the Continent is not applicable to India. Moreover, the data regarding land utilization, area under crops and systems of tenancy and tenures is available in the land records.

The list of census items prepared by the FAO is however intended to provide guidance to the member countries and to indicate the general scope of the census. These lists are expected to be modified and adopted to the conditions of each individual country. It is therefore necessary to examine to what extent the data with reference to the minimum list is available at present or will be available when the recommendations made herein are implemented. That will enable us to decide whether and if so what items need to be added to the list and how the collection of additional data is to be organized. The specimen tables appended to the programme also indicate the manner in which the data collected through census is required to be presented. In designing the plans for the census therefore the scope of these tables also has to be kept in view.

AVAILABILITY OF DATA REQUIRED BY THE FAO ON ITEMS IN THE SHORT LIST

5.5. Availability of Data on items included in the Short List.—The present position with respect to the availability of the data in the reporting provinces and states on each of the items covered by the short list is described below:

(I) *Tenure.*—Information on the number and size of cultivators' holdings and the systems of tenure under which they are held is to be collected under this head. The information available in India relates to ownership holdings, but not to cultivators' holdings. Since however the name of the cultivator is also recorded in the land records in most of the provinces, the desired information can be obtained by suitable retabulation of the information contained in the Khasra Registers. This is indeed the only additional work which is to be undertaken in the census year.

(II) *Land Utilization.*—At present the statistics of land utilization are collected and published in Table II of the 'Agricultural Statistics of India' for reporting areas only. This information can therefore be obtained by an enumeration of survey numbers, i.e. corresponding to the harvest inspection carried out by the patwaris in the temporarily settled provinces.

Although the existing classification of area adopted for Table II does not conform to the pattern proposed by the FAO in the specimen Table V, the revised classification meets their requirements. The data can easily be compiled from the Khasra Register.

(III) *Farm Population.*—Information on the number and characteristics of people dependent on agriculture and livestock as their main and subsidiary means of livelihood is to be given under this head. This information is collected in the

population census but as the extent of cultivator's holding is not included in the scope of the questionnaire for the population census, the data obtained through the population census cannot be co-ordinated with the data relating to the efficiency of agriculture. This information can however be obtained during the proposed complete enumeration of holdings by putting a few questions on the means of livelihood of the cultivator, the number of people dependent upon him, and the number of farm-servants permanently attached to the holding.

(IV) *Crops*.—The present position regarding the availability and the reliability of the statistics of acreage under crops and yields of principal crops has already been described in the previous Chapters. The existing statistics will serve the needs of the census.

(V) *Power*.—The question on 'power' put in the short list of census items merely reads: "Was animal power used on this holding last year? Was mechanical power used on this holding last year?" In India, it is true to say that almost all the cultivators utilize animal labour for agricultural work. The number of animals employed for draught purposes is obtained during the livestock census. Similarly, the number of tractors, oil engines and sugarcane crushers owned by the cultivators are known from the livestock census.

(VI) *Livestock and Poultry*.—The scope of the livestock census carried out in India is comprehensive enough and gives all the details of classification of livestock and poultry, in so far as the types of animals that are common in India.

5.6. *Availability of Information Holdingwise*.—Thus most of the information on the items included in the short list is already collected in India. A perusal of the specimen tables forwarded by the FAO shows that the various data are to be presented in a form which gives the data according to the size classification of the holdings reporting the characteristics. Thus not only the total area under each of the different crops is to be given, but also the distribution of the area among the holdings of different sizes growing these crops is to be specified. At present, only the figures for 'total area' are available in India, but this information could be retabulated in the desired manner, once the basic data is obtained. As in any case, the cultivators will not be in a position to give the extent of area under the different crops grown by them, the only feasible method of furnishing the information in the desired form is to re-classify the data collected through the Khasra Registers to give the particulars in respect of each holding.

AVAILABILITY OF DATA REQUIRED BY THE FAO ON ITEMS IN THE EXPANDED LIST

5.7. *Additional particulars on Items included in Short List*.—In the expanded list, the scope of the items given in the short list is slightly enlarged. For instance, under the systems of tenure, more details of rented tenures (*i.e.* whether on fixed cash basis or on crop-sharing basis) are to be specified in the expanded list, while in the short list only the areas owned and rented are to be mentioned. Similarly, under land utilization, the details of irrigated and unirrigated arable land and the areas

under specialized vegetable cultivation are also included within the scope of the expanded list of items. Information regarding the detailed particulars of the different types of tenancies under which the land is cultivated is at present available in the Khasra Registers in the temporarily settled provinces. Similarly, the details of irrigated and unirrigated area under the principal crops are also available. Statistics of fruits and vegetables separately are not at present available, since according to the existing classification, these are given under a single head, but the revised classification at present under consideration will, if adopted, enable the collection of detailed statistics of the areas under different fruits and vegetables. Information regarding the details of the age of holder and the number of days spent on non-agricultural work which are included under 'Agricultural Population' in the expanded list is not available at present.

5.8. *Additional Items included in the Expanded List.*—As regards the additional items included in the expanded list (part B), the present position is discussed below:

- I. *Employment in agricultural work.*—With respect to the first, it is not feasible nor necessary to obtain the detailed particulars of the employment in agricultural work by a complete enumeration of all the cultivators. While the scope of the complete enumeration should be confined to the essential particulars of the holding, such items of detail as the conditions of employment should be covered by suitably designed sample surveys. Moreover, in India where agriculture is practised more as a means of living rather than an organized industry, it is very difficult to get reliable figures regarding the extent of employment offered by it to the agricultural population.
- II. *Agricultural Technology.*—Except the details of the electric power available to the holding, the other particulars of animal or mechanical power utilized on the holding are at present collected during the livestock census. As the use of electricity in rural areas is not widely prevalent, this question is unimportant in the Indian context. Similarly, the distance of each farm from the nearest all-weather road is also a detail into which we need not go in the present census.
- III. *Fertilizers and Soil Dressings.*—It is possible to obtain an estimate of the percentage of area which is manured either with fertilizers or other manures, through the sample surveys designed for estimating the yield of principal crops. A rough estimate of the area receiving fertilizers can also be made from the amount of fertilizers distributed by the Provincial and State Governments.
- IV. *Irrigation and Drainage.*—Fairly reliable statistics of sources of irrigation and the extent of area irrigated by each source are available. These are collected mainly at the time of field-to-field crop inspection. No statistics of drainage are however maintained.
- V. *Fragmentation.*—The existing land records do not give any estimate of the extent of fragmentation prevalent in India. But this information can be extracted with the help of the village

field map. In the forms proposed for the complete enumeration of holdings, this information is sought to be obtained by questioning the cultivators and should be verified by a reference to the village map.

VII. *Wood and Fishery Products*.—Although in the foreign countries, wood and fisheries form different enterprises which may be undertaken by the farmer either along with or independently of agriculture and livestock, in India, the conception of these enterprises is entirely different. The question of collecting statistics of fisheries and wood products should be taken up separately. No useful purpose is served by extending the scope of the agricultural census to cover these items.

5.9. *FAO Census in Permanently Settled and Unsurveyed Areas*.—In areas where either the reporting agency does not exist or cadastral survey maps are not available, we have already recommended that an *ad hoc* reporting staff should be appointed. With the help of this staff, rough sketch maps of the villages should be prepared as already suggested and the information on the various items included in the census should be obtained as accurately as possible.

5.10. *Conclusion*.—Thus it will be seen that the data available at present and that is proposed to be collected in the future cover the entire scope of the short list of items proposed by the FAO and also certain items from the expanded list. The general principles underlying the collection of data for the FAO Census should be as follows:

- (i) We should collect the data on all items included in the short list, by the method of complete enumeration. The annual and quinquennial complete enumeration surveys now proposed cover this data completely.
- (ii) The data on items of production should be collected by crop-cutting surveys on the random sampling basis annually.
- (iii) The data on items in the expanded list such as additional particulars of holdings should be collected through random sampling surveys, once in five years, in so far as the items are of relevance in the Indian context.

In effect, the implementation of the recommendations made herein will lead to the conduct of a quinquennial census of agriculture in India. The quinquennial retabulation of the data from the Khasras, holdingwise, enables the presentation of most of the data in the specimen tables recommended by the FAO.

CHAPTER VI

RELATIONSHIP BETWEEN THE AGRICULTURAL CENSUS AND THE CENSUS OF POPULATION

6.1. *Economy in Integration of the Two Censuses.*—The next decennial census of population is due to be taken in India during March, 1951. Since the agricultural census also is to be conducted in the year 1950-51, it is often felt, that considerable economy may be effected if these two censuses are integrated in so far as it is technically feasible to do so; and it is one of the terms of reference of this Committee to explore the directions in which this integration can be effected. The FAO has also recommended that “the details of relationship between the two types of censuses will need to be developed according to the circumstances in each country”.

6.2. *Scope of the Population Census.*—The questionnaire for the next population census covers among other items (i) name or relationship of head of house-hold, (ii) nationality and community or tribe, (iii) marital status, (iv) age, (v) place of birth, (vi) mother tongue and other languages known, (vii) literacy, (viii) means of livelihood, and (ix) sex. The data is to be collected through *ad hoc* staff of honorary enumerators appointed for this purpose. These enumerators are drawn from officials and non-officials, the services of the village revenue officers and the school teachers being mostly employed in the rural areas. Beginning with this year's census, houses are proposed to be permanently numbered. The enumeration proper consists in visiting each house and filling in blank enumeration slips on the basis of a direct interrogation of the head of the household, a few days before the date fixed for the census. On the census date, and a few days after, the entries are checked up by a rapid survey, and the necessary alterations are made. A supervisory staff is also employed to supervise the work of the primary enumerators. The enumeration slips are collected at a few central places in each province and state, and the data is tabulated with the help of specially appointed paid compilation staff, by the hand-sorting method.

6.3. *Possibilities of Integrating the Two Censuses*—The possibility of integration of the censuses of agriculture and population needs to be explored in the following two directions:—

Firstly, whether during the (population) census year, complete enumeration surveys for the agricultural census can be combined with the population census by having a common questionnaire and by collecting the data for both the censuses through the same enumerator; secondly, whether combined sample surveys can be conducted to give data on agriculture as well as population.

6.4. *Integration at primary enumeration stage not feasible.*—Since the enumeration slips for the population census have already been finalized and arrangements for their printing completed, the question of having a combined questionnaire for the censuses of agriculture and population does not really arise. Moreover, even if a combined questionnaire were possible it will not be feasible to integrate the two censuses at the primary stage of enumeration, for, the technical problems involved in the two are different. The primary unit of enumeration for the census of population is the individual dwelling, and the census covers only a small number of items, has to be completed in a very short time, and extends to both

rural and urban areas. On the other hand, the unit of enumeration for most items in the census of agriculture is the individual field on the cultivator's holding, and the census covers a long list of items, has to be carried out over an entire crop year covering the different crop seasons, and is confined mainly to rural areas. Any attempt to integrate the questionnaires of these two censuses will result in such a complicated and unwieldy form of return that it may defeat the purpose of both. If the detailed items proposed for the two censuses are scrutinized, it appears that only the item relating to the characteristics of farm population is common to both. The occupational classification of the agricultural population is included in the scope of the population census. But the object of the question is to form an idea of the comparative magnitude of the numbers of persons pursuing different occupations. The object of such a question in the agricultural census will be to obtain an idea of the labour potential in farming and its relation to the other aspects of agricultural economy such as the size of the holding, number of cattle, the number of implements, etc. This question will thus have to be included in both the censuses and will have a different bearing in each.

Further, the census of agriculture is in a sense an extension and intensification of the data collected annually as a routine administrative measure essential for planning and progressive developmental policies and programmes in the field of agriculture. The variability in the response of the factors determining agricultural development requires that such statistics should be collected at least at intervals of five years and that they should be collected by the same administrative agency which collects the annual statistics so as to maintain continuity and experience in collection procedures. The census of population on the other hand is, at present at any rate, and *ad hoc* count once in 10 years, conducted to provide basic data relating to all the numbers and characteristics of the population which though of general utility to all programmes and policies, is of less direct import to those in any particular sector of the economy. The combination of these two censuses is therefore of no advantage and is besides not practicable.

8.5. *Scope of the Questionnaires should be co-ordinated.*—At the same time, the data obtained through the two censuses needs to be correlated, if possible. For instance, it is important to adopt uniform definitions of agricultural population, so that the data collected in the two censuses do not give varying estimates of the same population. At the instance of the Ministry of Agriculture, the Census Commissioner has recently accepted a proposal to enlarge the scope of the existing occupational classification of the agricultural population. In the same way, it will be useful to require that the house number allotted in the census of population to the household in which the cultivator lives should be stated while filling in the proforma for the complete enumeration of holdings in the Agricultural Census. The possibilities of similar co-ordination of the schedules may be explored further.

8.6. *Feasibility of Integration of Sample Surveys.*—As regards the possibility whether combined sample surveys can be conducted for the two censuses, we have little or no information, which could form a basis for discussing this aspect. Firstly, we are not aware as to what sample surveys are proposed to be undertaken in connection with the population census. Secondly, no specific sample surveys beyond the annual crop-cutting surveys have yet been planned in connection with the agricultural census. Thirdly, the units of sampling will normally be different for sample surveys relating to the two censuses.

Thus there appears to be no scope for integrating the two censuses of population and agriculture, at the sampling stage, in so far as the basic sample surveys for the agricultural census are concerned. Wherever and whenever possible, however the possibility of organizing joint sampling investigations not only on problems connected with population and agriculture but on problems relating to others sectors of the country's economy should be explored.

6.7. Integration of Administrative Organizations.—The possibility of integrating the administrative organizations for the two censuses although apparently attractive and economical is not practical for the following reasons:—

- (i) The population census is a federal subject while the agricultural census is a provincial responsibility. The constitutional position regarding the respective jurisdiction of the Provincial and Central Governments with respect to the two censuses counsels that they should be kept distinct. The expenditure on the population census tabulation is met by the Central Government, while the routine compilation of the data of agricultural statistics is a normal function of the Provincial Departments of Revenue or Agriculture and hence the cost has to be met by the Provincial Government.
- (ii) The agricultural census is a pioneer attempt and as such requires more spade work and initiative in organizing the work in the first year. A special drive is necessary for implementing the various proposals of improvements of agricultural statistics. The organization of the various surveys requires the necessary background of technical knowledge of agricultural statistics.
- (iii) If the Population Census Commissioner at the Centre and the Provincial Census Superintendents are to be responsible for the agricultural census, they will have to be provided with special Deputies, with agricultural experience, to assist them in their work. Thus there is no appreciable economy of expenditure arising out of the combination of the two functions. When in any case special officers of the status of a Deputy Commissioner or Deputy Superintendent will be necessary for the purpose of the agricultural census, the balance of advantage definitely lies in favour of a special officer being appointed in the Revenue or the Agricultural Departments and given independent charge of the agricultural census.

Thus since the agricultural aspect of the census is bound to suffer in any such combined scheme for the population and agricultural censuses it is desirable to keep the administrative organizations for the two censuses distinct at all stages.

6.8. Need for Co-ordinating Committees.—While we consider that the work of the two censuses has to be kept distinct, we recognize that it is necessary to avoid over-lapping in dates, and the timing of the censuses, simultaneous pressure on the patwari, and the rush of printing of forms. This can be avoided by setting up Standing Advisory Committees consisting of (i) the Population Census Superintendent, (ii) the Special Officer for the agricultural census, and (iii) the Provincial Statistician dealing with agricultural statistics, both at the Provincial (State) and Central Governments so that any such points can be settled by mutual discussion. Any

other officers concerned with either census may be co-opted on these Committees. The Committees should be set up as soon as the respective officers have been appointed.

We are generally of the opinion that provided Standing Advisory Committees are set up to co-ordinate the two censuses there is no further need, nor is it feasible to integrate the two censuses of population and agriculture.



CHAPTER VII

STANDARDIZATION OF FORMS OF RETURNS

7.1. *Standardization of the Basic and Abstract Forms.*—We have seen in Chapter II that in order to rationalize the collection of agricultural statistics it is necessary to evolve two basic standard forms, one to be filled in every year and the other every five years giving complete particulars of the Survey number and the cultivator's holding respectively. All the abstract agricultural statistics in respect of each geographical unit of tehsil, district, province, and Indian Union as a whole can be derived from these basic forms. The data so collected will also meet the requirements of the FAO Census. It is necessary to standardize these abstract forms also so that the data collected will present uniformity both with respect to the form and the content. It is desirable to prescribe such forms for the smallest administrative unit *viz.* the village.

7.2. *Scope of the Abstract Forms.*—Even at present, similar abstract forms are prescribed in the Land Records Manuals. For instance, in the East Punjab there is the *Lal Kitab* giving consolidated agricultural statistics for the village in about nine forms and is maintained by the patwari for each of the villages in his jurisdiction separately. The important agricultural statistics which are to be compiled annually are those relating to statistics of land utilization, area under crops with area irrigated under each, area irrigated from different sources, and transfers of agricultural property. Of these, information on the first three items is published in the 'Agricultural Statistics of India', in Tables II, IV and III respectively. The data could be derived from the basic standard form, the Khasra, and annual abstract forms should therefore be prescribed in respect of these four items.

Similarly, a quinquennial compilation is necessary in respect of the items on which information is collected in the quinquennial basic form. Suitable abstract standard forms should be prescribed for collecting statistics of holdings, holders' crops, and livestock. In addition to these, it is necessary to have standard forms also for collecting information on tenures and sources of irrigation, once in five years. At present no data is available in respect of cultivators' holdings while the available information in respect of other items is not properly tabulated, in the manner desired by the FAO in the specimen tables. Such a tabulation is essential even to meet the requirements of our developmental plans.

In addition to the annual and quinquennial abstract forms, it is necessary to provide another standard form in which the forecast returns should be obtained from the primary reporters. This form will be periodical.

7.3. *Standard Forms.*—Thus the total number of forms which will be necessary is 13 as detailed below :

Classification	Code No.	Form
	<i>Annual Forms</i>	
Basic Form	V. F. : A	Khasra Form.
Abstract Forms	V. F. : a 1	Crop Abstract.
	V. F. : a 2	Land Utilization Abstract.
	V. F. : a 3	Irrigation Abstract.
	V. F. : a 4	Abstract of Transfers of Agricultural property.

Classification	Code No.	Form
<i>Quinquennial Forms</i>		
Basic Form	V. F. : Q	Holding Form.
Abstract Forms	V. F. : q 1	Holdings Abstract.
	V. F. : q 2	Abstract of Tenures.
	V. F. : q 3	Abstract of Holders.
	V. F. : q 4	Holdingwise Abstract of crops.
	V. F. : q 5	Abstract of Livestock etc.
	V. F. : q 6	Abstract of Sources of Irrigation.

Other Forms

Periodical	V. F. : f	Primary Forecast Return.
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Sample forms are given in Appendix I.

ANNUAL FORMS

BASIC FORM: KHASRA FORM

7.4. *Khasra Register*.—The Khasra Register is a field book in which the patwari enters all the facts required for agricultural statistics in respect of each survey number or sub-number into which all surveyed land is divided. He is normally expected to visit all the fields in the village generally twice (or thrice) a year to make relevant entries regarding the crops grown on each plot of land in the different seasons of the year. In Madras, however, the patwari makes a regular monthly inspection of cultivated areas and notes the area cultivated with different crops in each survey number in his inspection note-book, which corresponds to the Khasra Register in the other provinces. Even with respect to the other information contained in the Khasra Registers the detailed particulars given and the form of presentation of the data differ from province to province.

7.5. *Variations in Khasra Registers*.—The chief variations in the form of the existing Khasra Registers of the temporarily settled provinces are described below:—

- (i) Except in Madras, the name of the cultivator together with the system of tenancy under which the land is held, is given in the Khasra Registers of all the temporarily settled provinces.
- (ii) The field book is maintained in the form of a loose-leaf register in Bombay (containing 10 years' data), and as a continuous register in other provinces. Each page of the register in the East Punjab (and Delhi) contains space for four years' data regarding crops and fallows and in the C. P. for five years. In others, it is an annual register.
- (iii) The condition of the crop in each field is given in the village Inspection Note-book in Madras. In the East Punjab the failed and matured areas are specified. This information is not generally given in other provinces.
- (iv) In Madras, the months in which the crop is cultivated and harvested are also specified in the Note-book, so that, from that it is possible to prepare a monthly abstract statement of cultivation.

7.6. *Nature of Information to be given.*—It is desirable to specify the following particulars in respect of each survey number; its number and extent, the names of owner and cultivator, and the utilization of area including the area devoted to different crops.

These particulars can roughly be classified into two groups. Firstly, there is the group of items such as, extent of survey number, its utilization for non-agricultural purposes, sources of irrigation, classification of the soil, number of trees, etc. which do not change from year to year and are constant over a fairly long period of time. Secondly, there are items such as tenancies, crops and fallows etc. which vary from season to season. It is necessary to keep these two groups of items distinct when designing the standard form, in the interest of economy of effort and convenience of handling.

7.7. *Standard Form proposed.*—As the survey number is the ultimate unit of area, the particulars for each unit should be recorded on a separate page and the mode of keeping the Khasra Register in a loose leaf ledger as in Bombay suggests itself as the best form for this purpose. In the Bombay form, there is provision for recording ten years' data on each leaf giving the general particulars of the holding which are of semi-permanent character at the top and the annual details regarding tenancies, crops and fallows at the bottom. We consider that ten years is too long a period for the purpose of this loose-leaf register and since we have recommended that a complete enumeration of cultivators' holdings should be undertaken normally once in five years, it will be advantageous if the new Khasra Register is also prepared once in five years. From a practical view point it will be most convenient to have quinquennial loose-leaf register for the harvest inspections. The new form should cover a quarter sheet of paper, the upper half of which should deal with items of a semi-permanent nature and the lower half and the reverse of the sheet should deal with items of a non-variable nature.

7.8. *List of Items.*—With regard to the list of items to be given in the Khasra Register it is suggested that the following should be included:—

I. *Upper half*—

- (1) Survey No. (with sub-number if any), (2) Area, (3) Classification of land, (4) Name of owner, (5) Khewat (Jamabandi) Number, (6) Type of tenure indicating superior ownership, Zamindari or Inam tenure etc., (7) Description of land (uncultivated and cultivated type and extent), (8) Source of irrigation, (9) Number of fruit bearing trees, and (10) Remarks.

II. *The Rest*—

- (1) Year, (2) Crop season, (3) Name of cultivator, and village (in case of non-residents), (4) Khatauni Number, (5) System of tenancy and rent, (6) Crops and fallows, (7) Extent of area under each crop, (8) Extent of irrigated area under cultivation, and (9) Remarks.

This Standard Form may be designated Village Form A.

7.9. *Incorporation of changes in the Loose-leaf Register.*—If there are changes in the semi-permanent types of information, it will not be difficult for them to be incorporated in the loose leaf register, for such changes are not many in a period of five years. For instance, if the owner changes, his name may be crossed out and the new name written

underneath; or if the survey number is sub-divided, the leaf may be scored out and two fresh leaves introduced. Since forms for about two thousand survey numbers are likely to make the register voluminous the Khasra Register may be bound in any number of convenient volumes consisting of 200 to 250 leaves each (or according to the numberdars and pattis or tarafs). This system of having one Khasra Register for five years has a distinct advantage over that of an annual register in that considerable economy of time and effort is effected by avoiding recopying every year of all the information contained in the upper half of the proposed form.

7.10. *Same Form to be adopted throughout.*—It is possible that the special circumstances in each province may warrant the addition of a few more items or of more detailed particulars of some items in the list suggested herein. For instance, Madras may prefer to give the month of cultivation and the month in which the crop is harvested while Bombay may like to include “modes of tenancy” etc. in the form according to the code in vogue in Bombay. Similarly, in Assam, the name of the un-registered occupant of the dag (survey number) is also given in their Field book; this can, if considered necessary, be included under 4 as a separate item 4(a). In such cases the Provincial Governments should no doubt be free to add more items to the list proposed. While the manner of presentation and the number of items included should cover the minimum requirements considered desirable, the scope of the Khasra Form in a particular province need not be restricted to these items only.

7.11. *Changes necessary in other Forms.*—The addition of certain items in the Khasra form may render their inclusion in other forms at present used superfluous and thus these forms may require certain modifications. The Provincial Governments should examine this question and make the necessary alterations in the other forms. To quote an instance there is a column in the standard form showing the source of irrigation for each survey number. If any well or tank is situated in the survey number itself it will naturally be specified in this column. Then there is no need to maintain the separate form prescribed for the quinquennial census of irrigation in Bombay, since the necessary village abstract could be prepared from the Khasra Register itself.

7.12. *Modification in Special Areas.*—In some of the provinces, like the East Punjab, special forms are prescribed in certain specified areas such as canal colonies or areas of fluctuating assessments. In such cases, it is desirable that the standard form should be adhered to, though additional particulars required in the special conditions might be added where necessary. Further, there may be areas in certain provinces, although such areas may be very small in the temporarily settled provinces, where no Khasra Register is maintained due to special circumstances. In such areas suitable agency should be created for collecting these statistics, provided the areas are surveyed and field maps exist.

7.13. *Other Forms can be derived from this.*—Thus if this basic form is standardized, then all other forms can and should be derived from this by suitable combinations. In view of the similarity of requirements for such data in all areas, the essential subsidiary forms should also be standardized. For instance, a list of cultivators' holdings can be prepared from the Khasra Register and this will form the basis for the complete enumeration of cultivators' holdings. Similarly, information given in the Khasra Form can be retabulated to give (i) areas under different crops, (ii) details of irrigated land, or (iii) survey numbers and

areas held and cultivated under different systems of land tenure and tenancy, (iv) areas put to different types of land utilization, i.e. forests, (v) areas under different types of revenue classification etc. A complete list of sources of irrigation and the total number of fruit bearing trees could also be had from the Khasra Register.

7.14. *Modifications necessary in Permanently Settled Areas.*—This form should replace the existing Khasra Form in all the temporarily settled provinces and states. In the permanently settled areas also where the agricultural statistics are compiled by field-to-field inspection the same form should be adopted as a permanent measure. It may be that the inclusion of the name of the cultivator in the form for permanently settled areas may create some difficulty during the present transition period since the tenure holders may not give reliable information regarding the names of cultivators for fear of losing their rights. In some cases it may perhaps be considered whether this information may be asked for not every year but only in the years in which a complete enumeration of cultivators' holdings is taken. This form cannot however be filled in for unsurveyed areas for which no demarcation by survey numbers is available.

ANNUAL VILLAGE ABSTRACT FORMS

7.15. *V. F. a1, Crop-Abstract.*—Village Form a1, Crop Abstract gives the form in which the acreages under crops are to be abstracted from the Khasra Register and will be prepared for each crop season, replacing the existing crop abstract at the end of the harvest inspection.

- (i) The names of crops which are to be included here naturally differ from province to province and each province should compile a standard list of crops. It will be necessary to adopt the detailed classification of crops at present employed in the 'Agricultural Statistics of India' Table IV, 'Area under crops' as a minimum basis.
- (ii) While the Abstract of Crops is prepared in each season, the sum of the areas given in the abstract for the different seasons will at the end of the year give the total area under all crops.
- (iii) At present the statistics of area under irrigation are available only in respect of a few crops, but these statistics could be compiled cropwise from the standard Khasra Form 'A'. In the provinces where the areas under the different crops are given separately for each source of irrigation, the same practice may be continued.
- (iv) In the provinces where mixed cropping is largely practised, it will be necessary to have in addition to the net areas, gross areas under principal crop mixtures also. This may be given as in the supplement to Village Form a1.

Where only gross areas are recorded and net areas worked out on the basis of conversion factors at the district stage, the portion relating to 'Mixed Areas' in V. F. a1 not be filled in for the village.

7.16. *V. F. a2, Land Utilization Abstract.*—The abstract of land utilization giving the areas under different classifications of land can be prepared from the Khasra Register after the completion of the final harvest inspection of the crop year. The forms at present giving the area statement also vary widely in the different provinces and in a majority of

cases contain additional information say, regarding sources of irrigation etc. It will be but proper to confine the scope of this "*Milan-Raqba*" only to details of classification of land according to its utilization. In this connection, the Ministry of Agriculture have formulated certain standard classifications and definitions, and forwarded the same to the provincial and state governments for their consideration and adoption. The same form and with the same meanings attached to the definitions may be adopted for the Land Utilization Abstract, given in V. F. a2.

7.17. *V. F. a3 Irrigation Abstract*.—Similarly, the data regarding area irrigated from different sources can also be abstracted from the Khasra Register and given in the Abstract Form a3.

7.18. *Annual Abstract Forms V. Fs. a1, a2 and a3*.—At present the information contained in forms V. Fs. a1, a2 and a3 is required for purposes of Tables of 'Agricultural Statistics of India', Vol. I, Tables IV, II and III. Table III however gives area irrigated from different sources and also area of crops irrigated. In the forms suggested above, this particular table has been divided and the portion relating to area of crops irrigated has been amalgamated with the area of crops as given in a1.

7.19. *V. F. a4 Abstract of Transfers of Agricultural Property*.—Besides these annual statistics of acreage, another important item on which no statistics are at present compiled is that relating to transfers of agricultural property. Since every transfer of land is required to be registered in the revenue records, *viz.* the mutation register, the data is available at the primary source in all the temporarily settled provinces. This information is not compiled at all in any province except in the East Punjab and C.P. and Berar. Even in these provinces, although standard forms showing the village Abstract of Transfers of agricultural property are prescribed, it is understood that the data is not tabulated beyond the tehsil stages.

Regular data on transfers of agricultural property and on the value at which the sale of land takes place is quite essential in order to find out the trends in the agricultural economy. In view of the importance of obtaining this information, it is necessary to prescribe a standard form in which the data available at present can be compiled and tabulated. A suitable form is given in V. F. a4. This form is based on the existing annual abstract prescribed in the Punjab Land Records Manual. This form should be adopted in all the temporarily settled provinces. It may not however be possible to obtain this data in the permanently settled provinces on a village basis.

QUINQUENNIAL FORMS—BASIC FORM

7.20. *V. F. Q Cultivator's Holding Form*.—Just as the survey number is a geographical unit, the cultivator's holding is the economic unit of agriculture. Except in U. P., where the Khatauni gives the details of cultivated and uncultivated land, terms of cultivation and rent (cash and kind), in no other province is a separate list of cultivators maintained although this information can be obtained by recasting the data given in the Khasra Registers in all the other provinces (excluding Madras). The need for collecting the essential data regarding each holding at least once in five years and the method of collecting the information have been described in Chapter III. The standard form to be adopted for this purpose is discussed below:

7.21. *Form Proposed.*—All the information which it is intended to be collected in respect of each cultivator's holding cannot be obtained by a direct interrogation of the cultivators. There are items on which information can only be extracted from the Khasra Registers and others on which the data could be collected by putting suitable questions to each cultivator. Since it is desirable to have all the information with respect to each cultivator's holding on the same form. We should have a single standard form for the purpose, but divided into two parts, one part containing information that could be extracted from the records, and the other containing the replies from the cultivators.

7.22. *Scope of the Form.*—The first part should cover:—

- (i) details of the holding, *i.e.*, the survey numbers constituting the holding, area of each survey number, with the extent of area under cultivation thereof etc., and
- (ii) details of tenancy.

The second part should cover:—

- (i) Means of livelihood,
- (ii) Details of the cultivator's household,
- (iii) Livestock, poultry and agricultural implements,
- (iv) Number of scattered fragments, and
- (v) Number of farm servants (whole-time).

A suitable standard form has been drawn up and is designated as V.F.:Q.

7.23. *Items covered.*—The following comments may be added on the various items included in the form.

- (i) The types of tenancies in the different provinces vary widely and each province should draw up a standard list of such tenancies. This information could be obtained by a direct interrogation of the cultivators, but since the extent under different types of tenancies is also available in the Khasra Register, it is better to rely upon the revenue records from which this information could easily be extracted.
- (ii) It is generally not so easy to obtain information regarding the number of fragments into which the holding is divided by retabulation from the Khasra Register; but it is easier to obtain the same by a direct interrogation of the cultivators and can be verified by reference to village map.
- (iii) As regards the means of livelihood, there are three alternative methods of putting the question. We may obtain information on the means of livelihood of the cultivator himself, or of the family as a whole, or of each individual member of the family. It is not necessary to go into the detailed means of livelihood of each of the members of the cultivator's family. Here the object is to classify the agricultural population, according to the principal means of livelihood. This classification should also accord with that adopted in the population census. In the latter, if the person is dependent on another person either totally or partially, the means of livelihood of the person on whom he is dependent is enquired into. This leads to the obvious choice of the first question. Since the number of dependents on the farmer, both helpers and others is also obtained there would be no incompatibility between the two classifications.

- (iv) The details of livestock and poultry may be the same as those given in the present form for the quinquennial livestock census. However, in the case of camels in the province of East Punjab and the East Punjab States where the camel is an important draught animal for agricultural purposes, a local sub-classification of the column could be made. It is neither necessary nor desirable to sub-divide the column into male and female camels and young stock on an all India scale. Similarly, in certain provinces where a more refined classification of poultry giving guinea fowls and turkeys is called for, these may be included in the local forms for those provinces if the Provincial Government considers it necessary.
- (v) With regard to agricultural implements and machinery also, the existing classification might be adopted with the modification that the number of ghanis of stated capacities should be enumerated along with the livestock census. The Indian Oil Seeds Committee attach considerable importance to this.

7.24. *Jamabandi Form*.—The Jamabandi form giving the details of the Khewat, its ownership etc., is the next important form which is maintained by the patwari. Although the Jamabandi does not give any agricultural statistics, it describes the rights of the owner in the field and the assessment of land revenue for each Khewat. In some provinces it serves as the Record of Rights and is always a valid document in case of disputed ownership. The periodicity of the Jamabandi varies from province to province. It is annual in some provinces but is quadrennial in others like East Punjab, Delhi, etc. It would be convenient to have it once in five years, in those areas where it is quadrennial. While in areas where it is annual, it might continue to be so. The general trend of opinion in the Provincial Governments was against standardization of this form.

QUINQUENNIAL ABSTRACT FORMS

7.25. *Quinquennial Abstract Forms*.—Just as the annual village abstract forms were derived from the Khasra, quinquennial village abstract forms should also be derived from the basic form giving:—

- (i) The details of agricultural holdings by systems of tenancy,
- (ii) details of land held under different systems of tenure,
- (iii) details of characteristics of cultivators and their dependents,
- (iv) number of holdings reporting areas under particular crops,
- (v) abstract of livestock, poultry and agricultural machinery, grouped holdingwise, and giving the totals,
- (vi) abstract of sources of irrigation.

These forms are not entirely new, most of them being already in vogue, in some form or the other. The only form which is wholly new is that relating to holdingwise abstract of crops. The scope of some of the existing returns has been extended so as to cover not only the areas but also the number of holdings reporting the areas. For instance, statement giving the quadrennial abstract of cultivating occupancy of the *Lal Kitab* in East Punjab gives the areas under different types of cultivation but does not give the number of cultivators under these different types. Similarly, a table giving the systems of tenure and the incidence of land revenue is given in the 'Agricultural Statistics of India' and necessarily

relates to the ownership holdings. Here also the number of Khewats in which this land is held is not specified. Even for the livestock census, it is necessary not only to know the numbers of cattle but also the number of holdings reporting the cattle. The requirements of the F.A.O. as given in the model forms appended to the programme have also been kept in view in drawing up the Village Abstract Forms q1 to q6, as far as possible.

7.26. *V. F. : q1 Holdings Abstract.*—This gives the details of agricultural holdings cultivated under different types of tenancy—classified according to standard size-classification. The principal tenancies are: owned, rented and partly owned and partly rented. Other tenures also may be specified. The details of batai and cash-rented types of rented tenures—or the types of tenants with occupancy rights or long lease-holders also can be distinguished. These details will have to be worked out in consultation with the Provincial Governments. This information can be extracted from the Cultivator's Holding Form—V.F. : Q.

7.27. *V. F. : q2 Abstract of Tenures.*—Information regarding the areas under different types of tenures can be obtained from the Jamabandi Register. The number of Khewats and the areas under the principal types of tenures should be given as in form q2. It will be useful to give the total area temporarily settled and permanently settled and the revenue assessment from these areas also in the same form.

7.28. *V. F. : q3 Abstract of Holders.*—The Abstract of Holders gives the characteristics of farm population and is based on the information given in the Cultivator's Holding Form Q. If the cultivator returns agriculture as his principal means of livelihood and the other column is left blank, he may be taken to be totally dependent on agriculture. If in the 'subsidiary' column is given some other occupation, then the cultivator is classified under "principal occupation" of agriculture and lastly if agriculture is given only in the "subsidiary" column, he may be classified accordingly. These may be symbolized as 'T' for totally dependent, 'P' for principal and 'S' for subsidiary means of livelihood. The abstract tables may give only these details for agriculture and livestock without going into the details of other subsidiary occupations.

7.29. *V.F. : q4 Holdingwise Abstract of Crops.*—One of the items on which the FAO desire that information should be collected is the area under the different crops classified according to the size of the holding reporting it. This information is also essential for developmental purposes since it would give an insight into the relationship between the size classification and the nature of crop grown. The data can be obtained easily from the Basic Form Q. The retabulation of the information given in the Khasra Register, it will be remembered gives these particulars. This form may be filled in respect of those crops for which crop forecasts are issued.

7.30. *V.F. : q5 Abstract of Livestock.*—The consolidated information to be obtained in respect of each village should show the total number of animals, poultry and implements for each category of holdings and machinery. One of the serious drawbacks of the existing statistics of livestock numbers is that the data on livestock is not correlated with the cultivator's holding. This information can be obtained from the Basic Form 'Q'.

7.31. *V. F. : q6 Abstract of Sources of Irrigation.*—In some provinces quinquennial censuses of sources of irrigation are held, while in others the data is collected annually. This information is not properly compiled at present. V.F. : q6 gives the standard form in which this information can be collected. It is obvious that this information can very easily be collected from the Khasra Register.

OTHER FORMS

7.32. *V.F: f Primary Forecast Return*.—The need for prescribing a standard form in which the data on crop forecasts should be submitted by the primary reporter in order to expedite the supply of forecast information requires no emphasis. There is no uniformity at present in the methods adopted for reporting the data for crop forecasts, a reference to which has been made earlier in this Report. A suitable standard form, which is based on the form now in use in Bombay is given in V.F.:f. Since this information has to be submitted in time for the dates fixed for the release of all-India forecasts, this form cannot be prescribed on a monthly basis. It will be seen that the form suggested provides space for giving the data for all forecasts in the same page. The patwari may keep this as his office copy and send relevant extracts each time, on the prescribed due dates.

This crop forecast return gives total area under the crop in the current and previous years and the reasons for increase or decrease in the same, the anna-valuation of the crop and the details of area irrigated in the current year (to be given in the final forecast only). In the remarks column information as to whether the sowings were early, normal or late, in the case of earlier forecasts, and whether the harvesting commenced in time, in the case of later forecasts, may also be given.

7.33. *Definitions*.—Besides prescribing the standard forms, it is also necessary to define the various items entering the classifications adopted for the agricultural statistics. Not only are the vernacular names different in different provinces but also the same word denotes different things in the different provinces. While defining the various items, the requirements of international usage as contained in the proposals forwarded by the FAO should also be borne in mind. A standard list of definitions is given in Appendix II.

7.34. *Unit of Area Statistics*.—Allied with the question of adopting uniform definitions is the problem of adopting uniform units of measurement. The units in which the acreage and yield statistics are collected at the primary source vary very widely even within each province. The unit for acreage statistics should be the acre sub-divided into cents, while the unit for yield should be reported in terms of standard maunds and long tons.

7.35. *Size Classification of Holding Statistics*.—Finally, the size classification suggested by the FAO for giving holding statistics in the quinquennial abstract forms needs adaptation to Indian conditions. In view of the predominance of small holdings in India, we recommend that the following classification should be adopted.

Less than 1 acre.

1	and less than 2.5 acres
2.5	5
5.0	7.5
7.5	10
10	12.5
12.5	15
15	20
20	25

25 acres and above.

(The 2.5 acres unit is necessitated by the fact that the final classification suggested by the FAO is in terms of hectares).

7.36. *Conclusion.*—The adoption of the various basic and abstract standard forms will result in the primary collection on a uniform basis, of the agricultural statistics and also facilitate the subsequent compilation, consolidation and tabulation at the circle, tehsil, district and provincial stages and will thus improve the accuracy of the statistics collected. Once the forms are standardized, mechanical devices like the Hollerith etc., can later be adopted with facility when the tabulation of agricultural statistics is centralized in each province.

We recommend that these standard forms should be adopted as a minimum basis by the different Provincial and State Governments immediately. We wish to emphasise that the present time affords the best opportunity for introducing these standard forms in provinces and states where the existing revenue systems are rationalized.



CHAPTER VIII

ORGANIZATION OF AGRICULTURAL CENSUS

8.1. *Implications of the Agricultural Census.*—The collection of data for the agricultural census and the organization of agricultural statistics on systematic lines, are inextricably inter-related. The implementation of the proposals for improvement of the latter will lead to the collection of the data for the agricultural census. The significance of the first agricultural census is that the quinquennial surveys (complete enumeration as well as sample enquiries) will be conducted in the census year and every five years thereafter. The first agricultural census also marks the beginning of the drive for improvement of agricultural statistics and supplies the necessary impetus to Governmental action both at the centre and the provinces and states.

8.2. *Principles of Organizing the Census.*—Agricultural statistics being a provincial subject under the present Constitution, the organization of the census of agriculture must be decentralized, each province taking the administrative measures necessary for the implementation of the proposals. However, in order to secure the collection of data on a uniform basis in all the provinces and states, there should be greater Central co-ordination. We have already pointed out that the diversity in practices adopted at present is in a large measure due to this lack of Central direction.

8.3. *Nature of the Census Work.*—The organization of the agricultural census in each province or state involves the following types of additional work before and after the census:

- (i) initiating the administrative measures
 - (a) to extend the system of reporting to non-reporting areas, and
 - (b) to give effect to technical improvements in the methods of reporting agricultural statistics.
- (ii) amending the existing Land Records Manuals with respect to the new compilation procedures and the standard forms now proposed,
- (iii) organizing the primary reporting agency, and the supervisory agency, and training the field staff,
- (iv) compilation and tabulation of the census data and the preparation of the census Reports,
- (v) organizing the sample enquiries.

These duties, it will be readily agreed are much in excess of the normal functions entrusted to the existing provincial statistical organizations or to those envisaged for the future as recommended in Chapter IV.

8.4. *Special Officer for Agricultural Census in Each Province.*—In each province and state, the responsibility for this work should be formally vested in a single officer. This officer may either be the authority normally responsible for compilation of agricultural statistics, in which case, he will have to be provided with a full time Deputy with statistical qualifications or revenue experience, to assist him in his work. Alternately, a Special Officer may be appointed specifically for the purpose of the census. He should be responsible for maintaining liaison with the Agricultural Census Commissioner under the Central Government and initiating the necessary measures in the province, to organize the collection, compilation and presentation of the data.

8.5. *Organization at the Centre.*—Even with respect to the organization at the Centre, the nature and amount of the preparatory work to be done for the agricultural census is entirely different and vast when compared to the normal functions of the existing organization. For instance, the implementation of the proposals for improvement of agricultural statistics requires greater Central direction. The administrative measures taken in the different provinces need to be co-ordinated and for this purpose the Officer in charge will have to be constantly on tour and be in direct touch with the provincial officers. Although we have carefully gone into the various improvements that are necessary and laid down the general principles in sufficient detail, the actual implementation of these proposals may call forth for further clarification and elucidation, in relation to the existing conditions in any area. Even in this respect, the responsibility for organizing the census in the Centrally Administered Areas and the Indian states, where experienced Statistical Officers are not yet in charge of agricultural statistics, lies to a large extent in the organization at the Centre. The statistics of holdings are to be collected for the first time on an all-India basis and the compilation of this data as well as the retabulation of the data into various quinquennial standard forms is a new item of work so far not undertaken by the existing Central organization. The detailed planning of any sample surveys that may have to be undertaken also requires special technical staff at the Centre.

8.6. *Bureau of Agricultural Census.*—The Directorate of Economics and Statistics in the Ministry of Agriculture whose functions are mainly of the nature of compilation in the sphere of agricultural statistics cannot therefore undertake this additional work and we feel that it is necessary to set up a separate Bureau of Agricultural Census for the planning and direction of agricultural census in the Ministry of Agriculture, with a Commissioner of Agricultural Census at its head. The impetus and drive that are necessary for organizing the census can only be supplied by the creation of such special organization under an officer of a fairly senior rank. As a majority of the recommendations impinge on the sphere of Land Records, Agriculture and Revenue administration, it is desirable to have an officer with long experience in one of these Departments as the first Agricultural Census Commissioner. This officer should have a properly qualified statistician as his Deputy, to handle the technical problems involved in the conduct of the Census.

The tabulation of the census data and the publication of the Census Report should be done by this Bureau. After the Census, when the compilation and tabulation procedures are completed and standardized, the work of routine compilation in the subsequent years can be done by the Directorate of Economics and Statistics, as at present.

FINANCIAL IMPLICATIONS

8.7. *Financial Implications in Reporting and Non-reporting Areas.*—The additional functions to be undertaken in the provinces and states in connection with the agricultural census described in paragraph 8.3 can broadly be divided into two categories depending upon whether the primary reporting agency exists in any particular area or it does not exist. The financial implications of the census in these two areas may be worked out separately. To the estimate so arrived at, should be added the expenditure on the Central Bureau of Agricultural Census.

8.8. *Reporting Areas:—Items Entering the Cost.*—The items entering the total cost are the expenditure on the agencies for primary collection,

subsequent supervision and compilation at provincial and central levels, and incidental expenses on contingencies, travelling allowances etc. In addition to this another matter relevant to the consideration of the financial implications is that of centralized versus decentralized tabulation of the data. Since the necessary equipment for mechanical tabulation all over the country will not be available in time for the census and since we have recommended that centralized tabulation should be tried out only in provinces which possess the necessary equipment or have easy access to it, the estimates of expenditure which have been worked out in the Chapter are based on the assumption of decentralised consolidation and tabulation.

8.9. *Costs on Each Item.*—The expenditure on each of these items of cost in the areas where reporting agencies exist is discussed below with reference to an average province with 25,000 villages and 6,250 patwari circles.

- (i) *Primary Agency.*—The additional work which the primary agency will be called upon to do in organising the census will be
 - (a) preparation of list of holdings;
 - (b) actual house-to-house enumeration for collecting information not available in Khasra Registers;
 - (c) holding-wise retabulation of the information in Khasra Registers; and
 - (d) consolidation of the data in the form prescribed for the quinquennial abstracts.

The work will be of an arduous nature and will demand great care and attention on the part of the primary agency. Considering that the patwari will have to carry out this work in addition to his normal duties, the completion of the above mentioned work will take a period of two months.

If the patwari is to carry out the additional work efficiently and within the time prescribed, he should be compensated by a small remuneration. We suggest that a provision of Rs. 15/- per patwari should be made in estimating the cost of remuneration to the primary agency and on this basis the expenditure on this account comes to Rs. 93,750.

- (ii) *Supervisory Agency.*—In order that a patwari may carry out the duties efficiently within the time schedule prescribed, it will be necessary to provide adequate and effective supervision over his work. We suggest that for every unit of 100 villages or so there should be a full-time officer for the purpose entrusted with the duties of organizing the census within his unit, train the patwaris and supervise their work. These supervisory officers will also be responsible for consolidating the village tables in the form prescribed for the purpose. In provinces such as Bombay and Madras, the tehsil may be adopted as unit of supervision while in other provinces such as C.P. and U.P. the revenue inspector circle may constitute such a unit. Officers of the rank of naib tehsildars or revenue inspectors recruited from the Departments of Revenue or Land Records would be suitable for this purpose. These appointments will have to be made for a minimum period of four months, though it may become necessary to extend them by another month or so. We wish to emphasise that the duties of the supervisory officer would require the full

time attention of the officers concerned and as such no attempt should be made to saddle the existing officers with additional work.

The number of supervisors for a province of 25,000 villages would be about 250 and assuming that the supervisors are paid Rs. 150 per mensem in all, inclusive of D.A. the cost on this account for a period of four months comes to Rs. 1,50,000.

(iii) *Provincial Staff*.—Tables prepared in respect of each tehsil or revenue circle will be consolidated at the provincial headquarters. The Special Officer in charge of the agricultural census in each province and state will be responsible for initiating all the necessary measures for organizing the census in his province or state, for training supervisory officers at taluk or circle headquarters and for directing procedures for the collection, compilation and consolidation of the primary returns. In order that the Special Officer may be able to cope up with the work he should be assisted by a staff of 4 Statistical Officers of Class II rank, three in charge of field work and one to work at the headquarters. Moreover, in provinces where a full-time Agricultural Census Commissioner is not available but the existing provincial authority for the collection of agricultural statistics, is designated as the Census Commissioner to do this work in addition to his normal duties, he should be given a full-time Deputy to assist him in his work. The Census Commissioner will also need to have adequate clerical and computational staff to assist the Statistical Officers. A computing unit consisting of 5 assistants and 15 clerks and an establishment unit with 6 clerks, headed by a superintendent is considered adequate for the purpose. This staff may be appointed for a period of one year. The expenditure on the above staff at provincial headquarters may be estimated at Rs. 72,900.

(iv) *Contingencies etc.*—Contingencies including printing of forms, stationery, postage etc., and T.A. of the officers at the headquarters are estimated to cost Rs. 60,000.

Thus, altogether, we estimate that for a province of 25,000 villages where primary reporting agency is available, the organization of the census will cost approximately Rs. 3.8 lakhs. This would amount to Rs. 57 lakhs for the reporting areas of the Indian Union (taking the total number of villages in the reporting areas as 3,75,000 i.e., 15 units).

8.10. *Cost in Non-reporting Areas*.—For those areas where primary reporting agency is not available, an *ad hoc* agency may be appointed for a period of one year for collecting the required data. For this purpose it would suffice to appoint one enumerator for 12 villages in areas which are cadastrally surveyed and one for 4 villages in the areas not so surveyed. For in the latter areas the enumerators will have to prepare outline maps of villages and the lists of holdings for the first time. On this basis we estimate that for every 1,000 villages under the first category, the appointment of the primary and supervisory agency for a period of one year will cost an extra sum of Rs. 60,000 and for unsurveyed villages it will cost Rs. 1,80,000, the other items of cost remaining the same, as for the reporting areas.

Of the total area of 780 million acres in India, the surveyed and unsurveyed non-reporting areas are roughly 50 and 175 million acres res-

pectively, and on the basis of an average village of 1,500 acres, the total expenditure on the census in these non-reporting areas will be of the order of Rs. 240 lakhs.

8.11. *Central Bureau of Agricultural Census.*—The Commissioner of Agricultural Census at the Centre should be assisted by 4 officers and should have the necessary complement of junior staff consisting of 8 assistants and 24 clerks including establishment and computational staff. The cost on the organization of Bureau which it is necessary to set up for a period of two years, is expected to come to Rs. 3.4 lakhs.

8.12. *Total Cost on the Census: Rs. 3 Crores.*—The total expenditure on the Census in the provinces and states will thus amount to Rs. 297 lakhs comprising of Rs. 57 lakhs in the reporting areas and Rs. 240 lakhs in the non-reporting areas. Adding to this, the expenditure on the Central Bureau of Agricultural Census, the total expenditure on the census comes to Rs. 3 crores approximately. The detailed break up of the total expenditure is given in Appendix XI.

It may be pointed out that an expenditure of this order is not really excessive in view of the fact that accurate statistics of agriculture are of basic and vital importance in an agricultural country like ours. All programmes of development in the social and economic sphere can only be planned on the basis of adequate and correct information relating to the different sectors of national life, of which the agricultural sector is of prime importance. Any expenditure for the purpose of building up a reliable agency for the routine collection of such data will repay itself several times over in the form of the economies that will result in the expenditure on the different programmes.



CHAPTER IX

CONCLUSION

9.1. *Nature of Task.*—We have now come to the end of our task. We have in the course of our labours, examined the whole range of statistics in the sphere of agriculture, with a view to detect any gaps therein, discover the defects in the existing system of collection and suggest appropriate remedial action. While our examination has revealed the necessity of setting up suitable machinery for reporting where no machinery exists at present, and strengthening the existing machinery by reducing its burden and rationalizing its procedure, we are satisfied that the general pattern of the machinery as such is on correct lines and needs no radical alteration. The tempo of national development is placing a heavy strain on the whole machinery, and most of all on the patwari, who is its base, and it is essential that the Central, Provincial and State Governments should take all necessary steps to reinforce it at every stage. We also feel that the time has now come for an increasing association of the peasant, the landlord, the trader, the co-operative and other elements in the social life of the village with the collection of data, so that in course of years it may be possible to develop a strong non-official agency.

9.2. *Occasion of the Census should be Utilized for Improvement of Agricultural Statistics.*—Though the census of agriculture has drawn our attention to the need for reforming our statistical apparatus, the reforms, however, are called for, quite apart from the request of the FAO, by the requirements of our own planning in the field of Social and Economic reconstruction. We should, therefore, seize the occasion of the census to put our house in order and ensure that all the data required for planning a prosperous agricultural economy is collected in future.

9.3. *Preliminaries for the Agricultural Census.*—The organization of the census of agriculture will involve not only the revision of the existing forms for routine collection of data and the extension of the system of reporting to non-reporting areas but also the conduct of sample enquiries for checking the accuracy of statistics and for obtaining additional information. The different steps necessary for completing the preliminaries will be as follows:—

Firstly, the necessary amendments will have to be issued to the Land Records Manuals before the compilation procedures and standard forms recommended by us are adopted.

Secondly, the patwaris and other staff at various levels need to be appointed where they do not already exist and given training in compilation procedures.

Thirdly, technical details of necessary sample surveys will have to be worked out.

Fourthly, the financial implications have to be worked out in greater detail jointly by the Central, Provincial and State Governments.

9.4. *Steps should be taken immediately.*—There is thus considerable amount of preliminary work yet to be done and about 9 months are all that remain before the date suggested by the FAO for the census. It is therefore essential that the Central, Provincial and State Governments take immediate steps to proceed with the various preliminaries described

above. We are firmly of opinion that it is desirable in the interests of uniformity and international comparability of data, that the census of agriculture should be carried out at about the same time in all the countries of the world. It may be recalled that the FAO had originally suggested that the world census of agriculture may be conducted in the year 1950. When the last FAO Conference was held in Washington in 1948, many countries stated that they would be unable to carry out the census in 1950 and it was therefore decided that where a census could better be done in 1951 than earlier, the postponement will be in accord with the FAO Programme. The Conference also stated that it would be unfortunate to have the census postponed until after 1951 if that at all could be avoided. The census has thus been already postponed once and it is therefore of the utmost importance that a situation should not be created which would lead to its postponement for a second time.

In this connection, it may also be pointed out that the FAO has already decided to locate their Training Centre for Census Officials of the S.E. Asian Countries in India and that the Centre is expected to begin its work from 1st November, 1949.

9.5. *Conclusion.*—We should, therefore, like to express the hope, before concluding, that the Central, Provincial and State Governments will come to an early decision on our Report, and take immediate steps to set up the necessary administrative machinery within their respective jurisdictions to take charge of this work and initiate the necessary measures for implementing our recommendations.

W. R. NATU—*Chairman.*

N. C. CHAKRAVARTI.*

K. KISHEN.

H. C. KOTHARI.

N. T. MATHEW.

B. NATARAJAN.

V. G. PANSE.

G. M. SANKPAL.

S. M. SETH.

P. V. SUKHATME.

J. S. SARMA—*Secretary.*

NEW DELHI;

5th September, 1949.

* Signed subject to the Note of dissent appended.

NOTE OF DISSENT

By Mr. N. C. Chakravarti

I am extremely sorry to have to record a note of dissent in a report to which all other members of the Committee have agreed. This is partly due to my own fault of not having been able to attend either of the two meetings of the Committee for other important engagements in West Bengal.

I am grateful to Mr. W. R. Natu, the Chairman of the Committee, and Mr. J. S. Sarma, its Secretary, for having very kindly arranged a discussion between myself and Mr. Sarma over the points on which I prepared my first note on the draft report. This has clarified many issues and certain minor factual adjustments have been made. It therefore remains for me now to note a few points in respect of which I regret that even after my discussion with Mr. Sarma I have not been able to agree with the views and recommendations given in the main report.

2. I may mention that I agree with most of the recommendations of the Committee, particularly when they are taken individually. My fundamental disagreement can be summarised into two principal points. In the first place I am of opinion that the recommendations contained in the main report do not form part of one consolidated plan for the improvement of statistics of different components placed in its proper position in the comprehensive whole. The report covers virtually the whole ground of agricultural statistics, but the recommendations in many cases are more or less independent of one another which is likely to seriously handicap their implementation. Secondly, some of the recommendations appear to me to be incapable of implementation on organisational and financial grounds at the present time.

3. I shall take up the second point first. The report has recommended that certain items of statistics should be collected by complete enumeration annually by the patwaris where they exist or by a similar class of people to be appointed in areas where they do not exist at present. As a student of statistics I have the greatest attraction for a complete count in any matter in respect of which data have to be collected. I feel, however, that this line of action has two important limitations. The first is that complete enumeration being an extremely costly operation, should not be taken up for collection of data in matters where a scientific process, which is equally effective for the purposes in view but very much less costly, can serve the purpose. Secondly, it is necessary to ensure that if we want to have a complete enumeration we can really create an organisation and facilities which make such complete enumeration actually feasible.

4. In the present case my esteemed colleagues in the Committee have recommended that the patwaris should be employed for—

(a) carrying out a complete plot to plot survey in each season for obtaining data regarding land utilisation which would include acreage under each crop and acreage left fallow, proportion of mixed crops where they exist, of uncultivated patches in cultivated fields, orchards and area under vegetables;

(b) reporting on the condition factor of each crop in each village.

In addition to the above, once in every five years beginning with the

F.A.O. Census year of 1950-51 the patwari is proposed to be entrusted with the collection of data by the system of complete enumeration in respect of cultivators' holdings which would consist of the collection of the information regarding the cultivated and uncultivated lands, irrigated and unirrigated lands in the holding, the right and rights in which the different lands are held; the means of livelihood of the members of the family; the size and age-sex-distribution of members of the family; permanent farm servants kept; number and livestock, poultry, agricultural machinery and implements etc. Part of this information is proposed to be extracted from the khasra form to be prepared for each survey number and the rest collected by visiting and interrogating the families concerned.

The patwari is also proposed to be entrusted with the duty of consolidating the data in the abstract forms prescribed for the purpose in which the information will have to be shown by distribution according to size of holdings.

5. In Appendix IV of the main report has been shown the surveyed and unsurveyed areas of different provinces and states. In the body of the report, certain information has also been given regarding the number of patwari staff at present employed in certain provinces. It appears that at present U.P. has got a patwari for about every 3 sq. miles, East Punjab one for every 7 sq. miles, Bombay one for every 8 sq. miles (for the reporting area only), Delhi one for every 7 sq. miles, Bihar one for every 14 sq. miles, West Bengal one for every 14 sq. miles. I understand there is a Karanam for every village in Madras. No information is unfortunately available regarding the number of crop plots per sq. mile in different provinces of the Dominion or for the Dominion as a whole. My colleagues in the Committee estimate that if workers are employed on the above two types of work (of complete enumeration of acreages and holdings) a whole-time worker can cover ten villages of an average area of 25 sq. miles, while a part-time patwari or Karanam or Talati can cover about 3 to 4 villages or 7 to 10 sq. miles if he is also to carry out the other revenue and administrative duties. I feel that this estimate is unduly optimistic. I have had the privilege of carrying out various types of complete enumeration and sample survey work both on agricultural and economic front for the last fifteen years and I feel that even making all allowances for the advantage enjoyed by the patwaris of having extensive local knowledge and acquaintance, it would not be feasible for him in most places even in the surveyed area of the Dominion, to carry out the work properly if his jurisdiction is made as large as 8 to 9 sq. miles. Assuming, however, that an area of about 8 sq. miles would be the optimum average size for all provinces and states, this would mean that while Madras and U.P. will have adequate staff for carrying out the work, most of the other provinces and states will have to employ a very large extra staff. Bombay, for instance, will have to employ about 3200 more patwaris for the surveyed area only; West Bengal will have to employ 1600 in addition to 2000 persons they have; Bihar will need 4000 extra staff. It is possible that the local circumstances in some of these provinces (*e.g.*, lower number of crop plots in Bombay, little or no extra work in Bihar) may make it possible for these provinces to meet the need by employing a lesser number of staff, but even then the above would show that the implementation of the proposal will impose a fairly heavy additional financial burden. It may be mentioned that apart from the increase in the number of patwaris, the report recommends the appointment of certain overhead staff the cost of which will not be also inconsiderable. The report also recommends vaguely some annual sample survey for checking purpose at a further cost.

6. Turning now to the surveyed but non-reporting areas, 3000 new patwaris will be needed on the assumption of every such patwari being able to cover 25 sq. miles which, as I have stated, is entirely impracticable, particularly in areas where no patwari papers already exist.

7. For the unsurveyed areas the report has recommended the employment of a special staff at the rate of one for every ten sq. miles. This means that 27,000 field workers will be necessary to cover this area. Taking into account the overhead supervisory staff and the travelling and contingency expenses, the rockbottom minimum cost for this cannot be less than Rs. 3,40,00,000, taking Rs. 125 or so as cost per man-month. I may also mention here that the Committee has suggested that at least in some of the places where there has been no survey, the patwari or the special staff appointed should prepare sketch maps of the plots and note the area of such plots before the complete enumeration work is taken up. The magnitude of this work, I am afraid, has not been appreciated. It is possible that in a province like Madras where, as I am told, there is a Karanam for each village, this may be feasible. But Madras is not the whole of India and I believe in most of the unsurveyed areas the task will be extremely difficult and will cost much more than the Committee has visualised. The Committee has apparently recognised that this method will not be feasible in all the unsurveyed areas and has suggested that possibilities of evolving a sampling design may be explored where feasible or assistance taken from the Zamindars for getting the necessary information. Where there has been no survey landlords would not clearly be able to give plot to plot information. These recommendations relate to background of the complete enumeration work alone, but do not apparently take into account the first quinquennial surveys of holdings etc., for the immediate purposes of F.A.O. Census. I feel that an all-India Committee at the technical level could have given clearer pointers and suggestions for covering the entire ground.

8. The outcome of the above is that in my humble opinion the suggestion about complete enumeration given in the majority report, however much it may be desirable in theory, is incapable of being implemented in the immediate future except possible in a few provinces where there already exists a sufficient number of village revenue staff. I would accordingly suggest that complete enumeration as suggested may be recommended only for areas where either there is a sufficient staff already or a sufficient staff can be employed for the purposes in view.

9. As regards estimate of staff also, my suggestion is that while there may be slight variation from province to province in accordance with the density of crop plots, the average coverage for a wholtime worker engaged on complete enumeration for the acreage and other statistics proposed to be collected annually should be 1000 families and 12,000 crop plots, while for part-time workers like patwaris the number should be 500 families and 6000 crop plots respectively. It should be noted that I have used the term 'crop plot' and not 'survey number' purposely. A survey number may consist of several homesteads or several sub-plots each growing a different crop or some plots growing crops and some lying fallow and so on. For purposes of survey the unit naturally is the smallest parcel of land in which a separate crop or mixed crop is grown. All time and cost calculations must therefore be based on this.

10. The above suggestion is, of course, for surveyed areas where a fairly sufficient staff exists or can be employed for the above type of work. In surveyed areas where no such staff exists or can be employed in sufficient

numbers for the limitations of finance, time and organisational difficulties, a system of multi-purpose sample survey should be adopted for the present in accordance with the designs developed by the Indian Statistical Institute and used by them with a fair amount of success. For unsurveyed areas I maintain that until we have reasonably accurate information about the distribution of land and families in such areas, it is not feasible to carry out any complete enumeration within a reasonable cost. I accordingly suggest that for such areas we should adopt only one single system, that of a multi-purpose sample survey based on family sampling which we can easily do with the help of house lists prepared for purpose of population census.

The above will thus give us three systems for covering the entire Dominion instead of pursuing a multiplicity of systems in different provinces.

11. The second point which I should like to mention is about the necessity of having complete enumeration of crop acreage every year and of the holdings every five years. I understand that in all the temporarily settled provinces the patwaries have been keeping detailed records of the season to season crops grown in every individual plots and in some of them they also maintain fairly detailed accounts of the holdings and cultivators thereof. I have yet to know what use these provinces have been able to make of the information which is so patiently collected by the village patwaries. I realise that for purposes of revenue assessment, information about utilisation of land of each holding is of importance, but that importance surely does not extend the necessity of keeping record of crop in every individual sub-plot in a survey number and for each season or in respect of the cultivator who tills every such individual plot. We certainly do want to know the crop production of a province, of districts and probably of taluks also; we also want to know for purposes of economic planning, the size and distribution of holdings amongst cultivators, the adequacy or otherwise of cattle, implements and machineries; the extent of irrigated and unirrigated areas in each administrative region etc. For general planning purposes, neither the name of the cultivator nor the survey number of each plot is required, but only the totals, proportions etc., for each administrative region. Such information can very easily be collected at a fraction of the cost and energy employed in this work by adopting a suitably designed multi-purpose sample survey. I appreciate that at the time of implementation of schemes in the villages, more detailed information is necessary. But the patwaries who are supposed to have contact with every tenant by reason of his position in the revenue administration, can always get this information at the time of actual implementation of any development project. For instance, if it is decided to allot funds for re-excavation of tanks for irrigation in any area, it is then and then only that it becomes necessary for the patwari with the help of other village elders to fix the location of such tanks so that it can give the greatest benefit. Similarly, if Government could make available to a patwari's circle, say 100 maunds of improved seeds and 20 tons of manure, the question would then arise as to who are the most suitable cultivators to whom these should be distributed. It would not need a detailed khasra or holding survey for the Patwari to decide such matters. What then is really the point of getting such meticulous data about the name of each cultivator in relation to each plot or of each crop in relation to the plot in which it is grown and that also for 50 million cultivators of 5 lakh villages with perhaps 500 million plots. The fact that the revenue staff is already there to do the job is, I am afraid, not a sufficient ground for entrusting this work to them.

If such detailed study is really considered unnecessary at least at the present stage, the energies of the employees already working may be usefully diverted to other pressing development and economic upliftment work. As I have said, I do not impose complete enumeration. I concede most heartily that such a detailed complete enumeration for the whole country may and should be done once say in ten years to have a basic record on the basis of which even village authorities can work and from which relevant data can be extracted for purposes of planning at the taluk, district, provincial and country level. I would not oppose a quinquennial survey of this nature, but would request it to be considered if a decennial and more complete survey can serve our purpose still better.

12. I come now to the third and probably a still more important point. It would be seen from the summary of recommendations at the end of the report that for collection of statistics in respect of various agricultural subjects the Committee has made recommendations for a series of surveys, some of which are intended to be preceded by pilot surveys. Following is a list:—

Item 21 of Recommendations:

A sample survey for obtaining detailed particulars of cultivators holdings to be preceded by pilot investigations.

Item 26 of Recommendations:

Sample surveys for estimating yield of milk and production of eggs to be preceded by pilot investigations.

Item 28 of Recommendations:

Sample survey for collecting data regarding costs of production, utilisation of agricultural produce, rural indebtedness etc.

Item 29 of Recommendations:

Ad-hoc surveys for estimating food requirements and availability and for assessment of results of intensive cultivation.

Paragraph 3.39:

Extension of crop cutting surveys to cover statistics of yields of fruits and vegetables to be preceded by pilot survey.

It seems to me that if by carrying out pilot surveys in these sectors different designs are developed, it would mean the undertaking of different surveys for which either the patwari agency will have to be burdened with additional work or for which separate agencies will have to be appointed involving further extra expenditure. The recommendations as made contemplate in some places the integration of two or three subjects in one unit survey, but the report nowhere shows that the possibility of covering most of the items of agricultural statistics which we aim at collecting has been carefully considered, nor is it contained in the recommendations that the possibility of developing a technique for multi-purpose survey with this aim should be studied. The question of having a multi-purpose survey to cover all or a large part of the statistical work was considered in one of the meetings of the Committee, but apparently my colleagues were generally of opinion that such a survey was impractical. I would humbly state that from the experience we have had in West Bengal of conducting multi-purpose surveys covering many items of agricultural statistics I am definitely of opinion that such multi-purpose survey is not only feasible but would be very much more economic and efficient. I need not possibly give reasons as to how a multi-purpose survey by the sampling method would be more economic than a multi-

plicity of surveys. That is obvious. It may, however, be asked why I say that such a survey will be more efficient. This is because when an investigation is made covering a large number of the economic aspects of agriculture at the same time, the various economic factors which go to form the economic picture of a holding or a family automatically falls into its own place and their relative importance and position and even the degree of reliability of such data is to a large extent automatically checked against each other. I believe the above simple statement will indicate clearly the great desirability of developing a system of multi-purpose survey.

13. The country is at present passing through a serious financial and economic crisis. At the same time, accurate statistics is so vital a factor in planning and executing the economic upliftment of the country that every pice of the expenditure needed for the collection of such statistics **should be considered not merely an essential but a priortiy on the resources of the country.** With these considerations in the background I would suggest the following alternative plan for consideration :

- (i) As actual complete enumeration of the entire area of the Dominion is not feasible until the unsurveyed areas are properly surveyed or until some trained staff have worked for some time and gained experience of the unsurveyed areas;
- (ii) as any annual dependable complete enumeration of crop acreages etc. is impracticable for financial and other reasons even in the cadastrally surveyed areas except a few provinces where a sufficiently large patwari staff or similar staff already exists;
- (iii) as a complete enumeration of the holdings in the whole of the Dominion is equally impracticable for the reasons stated under (i) and (ii);
- (iv) as the system of the multi-purpose sample surveys has already been experimented and worked with a fair amount of success in West Bengal (though requiring further development which, however, can be carried out as the work proceeds), and
- (v) as for purposes of the F.A.O. Census of 1950-51 and for the extremely urgent need of production statistics of the country in connection with our food, import and other problems, we need reliable statistics on important aspects of agricultural economy without any delay. It is recommended that for the purposes of F.A.O. Census and our immediate needs for reliable statistics—
 - (a) statistics of as many subjects relative to agricultural economy as may be feasible be obtained by the system of multi-purpose sample surveys for all parts of the Dominion except the provinces which already have a sufficient number of village revenue agency to carry out the same work by the system of complete enumeration;
 - (b) immediate step be taken for starting cadastral surveys in all unsurveyed areas of the Dominion;
 - (c) for unsurveyed areas statistics be collected by the system of multi-purpose sampling using family samples chosen at random from house lists prepared for purposes of the 1951 census;
 - (d) as the implementation of this scheme would require a large number of trained personnel who can organise and carry

out the work in the various provinces where suitable trained staff do not exist, the Central Government should take immediate steps for organising one or more training centres for such staff in consultation with the I.C.A.R. and the Indian Statistical Institute which have had wide experience in large scale surveys of this nature.

14. As the feasibility of carrying out multi-purpose sample surveys has been doubted in some quarters, I am enclosing herewith as Annexure a short note indicating the lines on which such sample surveys can be carried out. It is not feasible to give full details within the compass of the present note, but indications given in the Annexure would, I hope, show that the carrying out of such a multi-purpose survey is quite practical both technically and financially.

15. As regards the other points not affected or covered by the remarks and opinions expressed in this note, I am in general agreement with the other members of the Committee and I generally endorse the views expressed by them in such matters. I accordingly sign the report subject to the observations made above.

N. C. CHAKRAVARTI.

ANNEXURE

For the proposed sample survey work, the area of the country need be divided into two categories, those having cadastral maps; those having no such maps.

2. For land utilisation data alone, the usual system of sampling could have been enough. But we want data in a large number of subjects. We cannot, for obvious and specially financial reasons, adopt separate systems of C. E. and sampling or even of sampling for each subject. We should therefore adopt a system of sampling which can give us data on *as many* (not all) of the subjects as feasible. In other words we must have a multi-purpose sample survey and must design our sampling technique accordingly.

3. This technique may be as follows: In cadastrally surveyed areas, taking the taluq, sub-division or district as unit, the entire area (as shown on each district map) should be divided into blocks of $\frac{1}{4}$ sq. mile each. In a province with say 50,000 sq. miles area we shall then have 2 lakhs blocks shown on maps, each of $\frac{1}{4}$ sq. mile size. Of these two lakhs blocks, 5,000 or 10,000 blocks will then be picked up at random, the number depending on the number of existing patwaris or the staff which the province or state can employ and on the degree of reliability intended to be achieved. These blocks should then be our samples.

4. The actual survey should then be carried out by trained patwaris or other *ad hoc* staff and would cover—

- (a) complete enumeration of all plots within the sample, showing their utilisation and the crop grown in each.
- (b) The counting of all poultry, livestock, fruit trees (not forming part of any orchard area), agricultural implements, carts, boats, transport vehicles, etc., houses, population (births and deaths during the year or the preceding year) and in fact in all subjects in respect of which such counting is feasible.
- (c) Crop-cutting experiments in plots selected at random in the sample and obtaining data about production of milk, eggs, fruits and vegetables.

(d) Enquiring and recording sizes of holdings, tenures and other details of each family in the sample, and so on, thus covering as many aspects of the agrarian economy as are depicted in the sample and as can be technically covered. A family budget enquiry for a number of families selected at random to obtain data regarding cost of living, indebtedness, etc., may be included.

5. In areas where there are no maps a two stage sampling will be needed. First, a percentage of the villages should be selected at random. From these villages every second, third, fourth or fifth etc. family should be selected from the "census house list". These families would then be the "samples" for survey. The area in khas (and other) possession of each such family together with the details of utilisation of such lands (crops grown etc.) can then be ascertained by visiting the lands belonging to such families and the other data collected as noted in paragraph 4.

6. The system of survey by block system and family system of sampling has been already tried with considerable success by the I.S.I. in various provincial scale surveys during the last fifteen years. With necessary adjustments these systems can be adjusted to suit the needs of all the provinces and states.

7. As to the financial aspects of this proposal, it has already been stated that the cost in this scheme can be easily regulated by increasing or decreasing the number of samples subject to a certain statistical minimum limit.

The total area of the Dominion is 780 million acres. If out of this 140 m. acres can be covered by C.E. by existing patwaris, one million sq. miles will have to be covered by sample surveys. This means 4 million blocks. A 5 per cent. sample would give 2 lakhs blocks for survey which can be covered by 25,000 workers as against at least 2 lakhs which will be needed for C.E. @ 10 sq. miles per worker in surveyed and 4 sq. miles in unsurveyed areas.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

Recommendation
No.

Paragraph
No.

GENERAL

1. A fairly large amount of statistical data relating to agriculture is collected at present by various agencies both as a matter of routine and through *ad hoc* enquiries. There are however wide gaps in the available statistics and the methods of collection are defective in many respects. In organizing the collection of agricultural statistics, the additional requirements of data for formulating plans of agricultural development have also to be borne in mind. The whole system of collection of agricultural statistics requires careful planning, greater co-ordination and proper organization. 1.29 & 3.1

STATISTICS OF ACREAGE

2. The acreage statistics in the areas which are cadastrally surveyed should be based on an annual complete enumeration of individual survey numbers.

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No.**

**Paragraph
No.**

- (i) If in such areas, reporting agencies do not exist, such agencies should be created or special staff should be appointed for the purpose of complete enumeration.
 - (ii) The accuracy of the data collected through complete enumeration of survey numbers should be ensured by employing rationalized methods of checking and supervision based on random sampling. The method of random sampling is a necessary supplement to complete enumeration but cannot be a substitute thereof. 3.4 & 3.5
3. In areas which are not yet cadastrally surveyed, immediate steps should be taken to initiate cadastral surveys.

Pending the completion of such surveys, suitable reporting agencies should be created and the coverage of agricultural statistics extended to all non-reporting areas.

- (i) Where the patwari agency exists, rough sketch maps should be prepared immediately and the estimates of areas should be based on the method of complete enumeration, with the help of these maps.
- (ii) Where the patwari agency does not exist, immediate steps should be taken to set up such an agency.
- (iii) Where the patwari agency does not exist and cannot be created in sufficient strength, for complete enumeration, in time for the Census, a skeleton staff should be appointed to formulate estimates of cultivated areas and specified types of culturable wastes, etc. The possibility of employing the method of random sampling should also be explored and adopted where possible. 3.16

CLASSIFICATION OF AREA

4. The classification of area adopted for Table II of "Agricultural Statistics of India" should be revised so as to give the areas separately in respect of (i) forests, (ii) barren and unculturable land, (iii) land put to non-agricultural use, (iv) culturable waste, (v) permanent pastures and other grazing lands, (vi) miscellaneous tree crops, (vii) current fallows, (viii) other fallow land and (ix) net area sown, according to standard definitions now proposed. 3.19
5. The present classification of area statistics for oilseeds, condiments and spices, and fruits and vegetables as used in "Agricultural Statistics of India" needs amplification. 3.18

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No.

Paragraph
No.

AREA UNDER MIXED CROPS, ETC.

6. The area under mixed crops should be reported as under:—
 - (i) The gross unadjusted acreage of the mixture should be recorded separately for each major crop-mixture and published in the Season and Crop Reports and Crop Forecasts, side by side with the net acreages of the components, as calculated at present.
 - (ii) Where fixed ratios are used for estimating the components of the mixture, they should be fixed for each district and their accuracy should be tested at periodical intervals during the crop-cutting surveys.
 - (iii) In the case of minor crop-inmixtures, the areas should be allocated to the various components according to the present practice in the East Punjab and Berar. 3.22
7. In the case of uncultivated patches in a cultivated field a reasonably accurate estimate of the area of the patches is desirable. 3.23
8. The area occupied by permanent bunds should be shown separately in the Khasra Register and the area occupied by temporary bunds may be included in the area reported under crops. It is however necessary to indicate the percentage allowance that has to be made for temporary bunds in the reported statistics. 3.25
9. The area statistics should relate to the areas sown and not to the area harvested. The normal percentage of harvested to sown areas should be estimated through sample surveys. 3.26
10. The existing practice of recording areas sown more than once is satisfactory and does not need any revision. 3.27
11. With respect to statistics of fruits and vegetables, the annual acreage statistics should relate to the area under fruit trees grown in groves and orchards. It will suffice if a complete enumeration of fruit trees is taken quinquennially in respect of other scattered trees. 3.28

STATISTICS OF YIELD

12. The statistics of outturn of principal crops should be based on annual random sample surveys. The scope of the existing crop-cutting surveys should be extended to all the principal crops and to all areas as quickly as possible. 3.29

Recommendation

- | No. | | No. |
|-----|--|------|
| 13. | The normal yield should be computed as a moving average of the actual average yields per acre obtained through crop-cutting experiments based on the random sampling method, conducted during the preceding ten years. | 3.33 |
| 14. | The final forecast of yield should be based on the results of crop-cutting surveys which have been found to provide provincial estimates of yield with a high degree of precision and estimates for most districts with a reasonable precision. Where, however, as in districts with relatively small acreage under the crop, the sampling error is high, it is desirable to utilize supplementary information from eye estimates of yields of a large number of randomly selected fields. | 3.38 |
| 15. | There should at least be two accurate forecasts in respect of each crop, one giving the estimates of acreage as soon as possible after the completion of sowings and the other giving the outturn of the crop after the harvest. While additional forecasts may be prepared during the intervening period for important crops, special measures should be taken to ensure the accuracy of the first and the final forecasts and to extend their coverage to the entire cultivated area. | 3.31 |
| 16. | It is necessary to extend the scope of the all-India crop forecasts to such pulses and cereals as are not already covered. The coverage of these forecasts should be extended to all areas. | 3.30 |
| 17. | The following procedure should be adopted for estimating the average condition factor, for the various administrative units in the province:—
(i) The patwari should be required to report the condition factor for a crop for each village under his jurisdiction.
(ii) The average condition factor for the revenue circle or firka should be worked out as the simple average of the condition factors for the individual villages in the revenue circle.
(iii) The average condition factor for a tehsil or district should be computed as the weighted average of the average estimates for each circle within the tehsil with weights proportional to the area under the crop in each circle.
(iv) The district condition factors should be expressed in terms of percentages with the normal condition factor representing 100. | 3.34 |
| 18. | The method of direct estimation of average yield in terms of maunds per acre is to be preferred to the anna method. In regions where the primary reporting agencies are accustomed to reporting in terms of the annawari, there may be initially some diffi- | |

Recommendation No.		Paragraph No.
	culty in changing over to direct estimation; but this change is desirable and should be brought about as rapidly as possible.	3.35
19.	'Stuart's correction factor' should be applied wherever there is reason to believe that the patwaris' figures of condition factor are biased.	3.37
STATISTICS OF HOLDINGS		
20.	A complete enumeration of cultivators' holdings should be taken once in five years which should include within its scope all items such as livestock, poultry agricultural implements, and machinery which have a bearing on the efficiency of cultivation. The particulars required in respect of each holding will be obtained partly by direct interrogation of the cultivators and partly by extraction of relevant information from the Khasra Register.	3.40 & 3.45
21.	Simultaneously with the quinquennial complete enumeration, sample surveys may be undertaken for obtaining more detailed particulars of cultivators' holdings. These surveys should be preceded by suitable pilot investigations.	3.41
22.	The data for the enumeration of cultivators holdings should be collected through the patwaris and other special staff employed for the enumeration of survey numbers.	3.48
23.	The present livestock census should be completely integrated and conducted as part of the quinquennial census of holdings. In the case of non-cultivating owners of cattle, whether in rural or urban areas, only those items which form part of the cattle census need to be enumerated.	3.49

HARVEST PRICES

24. The following procedure should be adopted for collecting harvest prices:—
- (i) A requisite number of representative villages should be selected in each district. In each selected village the prices at which the commodity is sold by the producer may be recorded in a standard form on specified day in each week, during harvest time.
 - (ii) In each district, the variety grown to the maximum extent should be adopted for purposes of price quotation.
 - (iii) The period of 6 to 8 weeks after the completion of the harvest may be taken as the period of harvest and should be fixed for each crop in each tehsil.
 - (iv) The present method of averaging should be replaced by the method of weighted average with the district production figures for the current

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- year as the weights. The weekly average price for the district may be obtained as a simple average of the tehsil prices which in turn may be obtained as a simple average of the village prices. A simple average of the weekly district prices taken over the season will give the single annual harvest price for the district as a whole.
- (v) Harvest prices should be collected through the normal agency employed for the collection of statistics of area and yield.
- (vi) The harvest prices should be collected in respect of all the forecast crops and should be published along with the final forecast. 3.51 & 3.52

AGRICULTURAL WAGES

25. It is necessary to collect statistics of wages of agricultural labour prevailing in selected representative villages on a fortnightly basis regularly. 3.53

STATISTICS OF MILK AND EGGS

26. Sample surveys to estimate the yield of milk and production of eggs should be conducted every five years. The Indian Council of Agricultural Research should undertake the pilot investigation in this connection. 3.54

MISCELLANEOUS STATISTICS

27. It is desirable to collect reliable estimates of the following items through the crop-cutting surveys:—
- (1) Areas under
 - (a) improved varieties of crops; and
 - (b) different types of manures and fertilizers.
 - (2) Percentage of harvested to sown areas.
 - (3) Rotational practices. 3.55
28. Random sample surveys should be conducted at periodic intervals for obtaining reliable data on costs of production, utilisation of agricultural produce, rural indebtedness, etc. 3.56 to 3.58
29. *Ad hoc* surveys should be carried out for the purpose of estimating food requirements and availability, and for the assessment of the results of intensive cultivation schemes. 3.59

PERIODICITY OF COLLECTION

30. The collection of data on acreage, yield and other agricultural statistics should be organised on the following lines:

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Annual—

(A) The existing forms which are annually filled in for the complete enumeration of survey numbers should be standardised and they should include all necessary items and be extended to all areas.

(B) Random sample surveys should be conducted annually for the estimation of yield of crops. The checking and supervision of complete enumeration statistics should be rationalized by introducing the principle of random sampling.

Quinquennial—

(C) A complete enumeration of cultivators' holdings should be conducted once in five years covering all the items having a bearing on the efficiency of cultivation such as livestock, implements, irrigation etc.

(D) Random sample surveys may be carried out along with the complete enumeration, for a more intensive study of cultivators' holdings.

Periodical—

(E) Sample surveys for collecting information relating to other items of agricultural statistics should be conducted periodically according to requirements.

3.62

ORGANISATION

31. The collection of statistics should be organised through the village revenue agency in the temporarily settled provinces and through special staff in the permanently settled provinces. Similar agencies should be employed in the states.

4.2

32. In order to remove the existing defects in the primary reporting agency and improve the accuracy of the statistics at present collected by them, the following steps should be taken:

- (i) the qualifications and conditions of employment of patwaris should be revised;
- (ii) the primary reporting agencies should be given special training in the collection of statistics;
- (iii) the jurisdiction of the patwaris and kanungos should be reduced wherever it is excessive;
- (iv) the number of crop inspections should be reduced and each inspection should be more thorough; and
- (v) the supervision of patwaris' work should be rationalized by introducing the principle of random sampling.

4.11

33 Increased supervision of the work of patwaris and kanungos, at tehsil and district levels is necessary. This need can be met by strengthening the present

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supervisory staff by the appointment of additional staff of appropriate grades at the tehsil and district levels.

4.13

34. In view of the growing importance assumed by agricultural statistics in planning the food policy, the Central Government should also create a suitable machinery which will exercise an independent check on the collection of agricultural statistics in the provinces and states as recommended by the Provincial Food Ministers' Conference.

4.14

35. At present, the tabulation of the data of agricultural statistics is decentralised. Where mechanical aids like the Hollerith Equipment are available as in Bombay, this type of equipment should be tried out, and extended to other areas, as far as possible. It is important, however, that the district compilation offices should be provided with calculating machines.

4.17

36. In each province and state, there should be an Agricultural Statistician of a fairly senior rank attached to the Department of Agriculture who should have the following duties:

- (i) compilation and publication of routine data;
- (ii) conducting sample surveys routine; as well as *ad hoc*; and
- (iii) analysis of agricultural experiments,

Where such an officer is not already in existence, he should be appointed immediately so that the various improvements suggested can be vigorously pursued and implemented.

There should also be an Economist in the Agriculture Department to advise the Provincial Government on matters of agricultural policy.

These officers should maintain liaison between the Provincial Department of Agriculture and the appropriate sections of the Central Ministry of Agriculture on all matters concerning agricultural statistics. As an effective method of ensuring this co-ordination, a Standing Committee of Central, Provincial and State Agricultural Statisticians should be set up.

4.20

37. At the Centre, all the work relating to agricultural statistics should be under the administrative control of the Ministry of Agriculture. The functions of the organisation at the Centre should be of two types *viz.* (a) Compilation and Economic Policy, and (b) Technical guidance and Research. Since the

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technical personnel and organisation required for these two types are different, there should be two separate organisations under the Ministry of Agriculture, as at present.	4.21 & 4.22
38. There should be adequate arrangements for securing co-ordination between the organisation dealing with agricultural statistics and other statistical organizations both in the provinces as well as at the Centre.	4.23
39. While the existing official agencies for the collection of agricultural statistics will always be indispensable, it is desirable to make a beginning towards building up a non-official crop reporting agency based on the voluntary co-operation of the cultivators, traders and others interested in agriculture. It is not suggested that non-official agency should replace the normal administrative machinery in the collection of agricultural statistics, but a beginning should be made to secure the co-operation of the village communities through the newly established janapadas and gaon panchayats in this task	4.25

FAO CENSUS OF AGRICULTURE

40. The general principles underlying the collection of data for the FAO Census should be as follows:
- (i) Data on all items included in the short list proposed by the FAO should be collected by the method of complete enumeration;
 - (ii) the data on items of production should be collected by crop-cutting surveys on the random sampling basis, annually; and
 - (iii) the data on items in the expanded list such as additional particulars of holdings may be collected through random sample surveys once in five years with respect to only such items as are of relevance in the Indian context.

5.9

INTEGRATION OF THE CENSUS OF AGRICULTURE AND THE CENSUS OF POPULATION

41. It is not possible to combine the two censuses of agriculture and population at the primary stage of enumeration; for, the technical problems involved in the two are different. At the same time the data collected through the two censuses needs to be co-ordinated by adopting uniform definitions and co-ordinated schedules, to the extent possible.

6.4 & 6.5

42. There is no scope for integrating the two censuses of population and agriculture, at the sampling stage, in so far as the basic annual and quinquennial sample surveys for the agricultural census are concerned.

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The possibility of integrating *ad hoc* sample surveys on other items of agricultural statistics with sample surveys in the sphere of population as well other spheres of the economy may be examined when such surveys are planned.

6.6

43. The integration of the administrative organisations for the two censuses is neither practicable nor will it lead to appreciable economy. It is desirable to keep the two censuses distinct at all stages.

6.7

44. In order to avoid any overlapping in the timing of the two censuses, and to avoid simultaneous pressure on the patwari, it is necessary to set up Standing Committees both at provincial and central levels. The Provincial Committee should consist of (i) the Population Census Superintendent, (ii) the Special Officer for the agricultural census, (iii) the Provincial Statistician dealing with agricultural statistics. Any other officers concerned with either census may be included on this Committee. The constitution of the Central Committee should be similar.

6.8

STANDARD FORMS

45. It is necessary to adopt two basic standard forms, one to be filled in every year with respect to each survey number and the other, once every five years, with respect to each cultivator's holding. From these two basic forms, the following village abstract forms should be derived.

(a) Annual Forms

(b) Quinquennial Forms

- | | |
|--|--|
| (i) Crop Abstract. | (i) Holdings Abstract. |
| (ii) Land Utilization Abstract. | (ii) Abstract of Tenures. |
| (iii) Irrigation Abstract. | (iii) Abstract of Holders. |
| (iv) Abstract of Transfers of Agricultural Property. | (iv) Holdingwise Abstract of crops. |
| | (vi) Abstract of Livestock etc. |
| | (v) Abstract of sources of Irrigation. |

A standard form should also be adopted for the periodical crop forecasts.

These forms are given in Appendix I to the Report.

7.1 & 7.2

46. The items included in the Basic Khasra Form should be the minimum number of items to be adopted throughout the province; provinces and states may add more items to it, if required.

7.10

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47. It is imperative that there should be uniform definitions of the different terms used in the compilation of statistics. Standard definitions are formulated in Appendix II to the Report which should be enforced immediately.	7.33

ORGANIZATION OF THE CENSUS OF AGRICULTURE

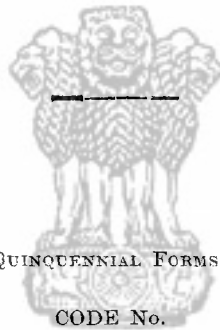
- | | |
|---|------|
| 48. The collection of data for the FAO census of agriculture and the routine collection of agricultural statistics on systematic lines are inextricably inter-related. | 8.1 |
| 49. Since agricultural statistics is a provincial subject, the census of agriculture has to be conducted by the provinces and states within their own area. In order, however, to ensure that the data is collected on a uniform basis, provincial and state action should be co-ordinated by the Central Government. | 8.2 |
| 50. In each province and state, the responsibility for this work should be entrusted to the agency normally responsible for the compilation of agricultural statistics or to an <i>ad hoc</i> agency specially created for the purpose, if the province so desires. | 8.4 |
| 51. It is necessary to set up a temporary Bureau of Agricultural Census in the Ministry of Agriculture for the planning and direction of the Census. This Bureau should be headed by a Commissioner for Agricultural Census who should have a properly qualified statistician as his deputy; they should have an adequate complement of junior staff. After the census work is completed and when the compilation and tabulation procedures are standardized, the routine compilation of agricultural statistics in subsequent years should be done by the Directorate of Economics and Statistics in the Ministry of Agriculture, as at present. | 8.6 |
| 52. When the revised forms of returns are introduced for routine collection of data, no special expenditure will be called for on account of the census in the reporting areas, except for a small allowance to the patwari. Special arrangements will however have to be made in the non-reporting and unsurveyed areas if the data is to be available in time for the census. In addition, special staff will have to be appointed for planning and supervision and for tabulating the data, at central, provincial and tehsil levels. The expenditure on the census may be estimated roughly at Rs. 57 lakhs in respect of reporting areas, Rs. 240 lakhs in respect of non-reporting areas and Rs. 3.4 lakhs in respect of the staff at the Centre, amounting to a total of Rs. 3 crores. | 8.12 |

APPENDIX I

STANDARD VILLAGE FORMS

ANNUAL FORMS

CLASSIFICATION	CODE No.
BASIC FORM	A Khasra Form
ABSTRACT FORMS	a ¹ Crop Abstract
	a ² Land Utilisation Abstract
	a ³ Irrigation Abstract
	a ⁴ Abstract of Transfers of Agricultural Property.



QUINQUENNIAL FORMS

CLASSIFICATION	CODE No.
BASIC FORM	Q Cultivator's Holding Form
ABSTRACT FORMS	q1 Holdings Abstract
	q2 Abstract of Tenures
	q3 Abstract of Holders
	q4 Abstract of Crops-holdingwise
	q5 Abstract of Livestock etc.
	q6 Abstract of Sources of Irrigation

OTHER FORMS

F	Primary Forecast Return
---	-------------------------

KHASRA FORM

Basic Form

V. F. A

1. Survey Number			4. Name of Owner	
2. Area			5. Khewat No.	
3. Classification of land.			6. Type of Tenure	
7. Utilization of land.	Type	Extent	8. Source of Irrigation.	
Uncultivated			9. No. of Fruit bearing trees.	
Cultivated				

10. Remarks.

Year	Season	Name of cultivator and residence	Kha-tauni No.	System of Tenancy and Rent	Details of cultivated area			Remarks
					Crops and fallows	Area	Area Irrigated	
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
I	Kharif	.....						
	Rabi	.....						
II	Kharif	.....						
	Rabi	.....						
III	Kharif	.....						
	Rabi	.....						
IV	Kharif	.....						
	Rabi	.....						
V	Kharif	.....						
	Rabi	.....						

CROP ABSTRACT*

Abstract Form
 Season.....Year..... Due on

V. F. all
 Details of area under different crops in the village of.....

Names of Crops	PURE			MIXED † (NET)			TOTAL	
	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
								(10)

(*) For each harvest inspection.

(†) In Provinces of C. P. and U. P. where net areas under mixed crops are not recorded for each village, these columns need not be filled in for each village.

Signature

Date

SUPPLEMENT TO CROP ABSTRACT

Supplement to
V. F. 3¹

Season.....Year.....Due on.....
Details of gross area under principal crop mixtures in the village of.....

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Name of mixture										
Irrigated										
Unirrigated										
TOTAL										

Signature.....

Date.....

LAND UTILIZATION ABSTRACT

Year.....Due on.....

Abstract Form
V. F. a2

Details of classification of area in the village of.....

(In acres)

Geograph- ical area	A R E A							U N D E R				
	Barren and unculturable land	Land put to non-agricul- tural uses	Cultur- able waste	Permanent pas- tures and other grazing lands	Misc. tree crops and groves not included in area sown	Current fallow	Other fallow land	Net area sown	Total cropped area	Area sown more than once		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	

Signature.....
Date.....

IRRIGATION ABSTRACT

Year.....Due on.....

Abstract Form

V. F. a3

Details of area irrigated from different sources in the village of.....

(In acres)

A R E A							I R R I G A T E D			F R O M		
Government Canals	Private Canals	Tanks	Tube-wells	Other wells	Other Sources	Net Area Irrigated	Gross Area Irrigated	Area irrigated more than once				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)				

Signature.....

Date.....

ABSTRACT OF TRANSFERS OF AGRICULTURAL PROPERTY

Year..... Due on.....

Abstract Form Details of Land transferred etc. in the village of.....
V. F. a4 (by owners and hereditary tenants)

Nature of right transferred	Partitioned		Transferred by Inheritance		Gifts		Exchanges		Mortgage		Redemption of Mortgage		Sale or Permanent Transfer for Value	
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Superior Ownership														
Ownership														
Right of Occupancy														
TOTAL														

Signature.....

Date.....

CULTIVATOR'S HOLDING FORM

Basic Form

Year.....As on.....

V.F.Q

I

S. No.	Name of the cultivator	House Number	Khatauni Nos.
(1)	(2)	(3)	(4)

(TO BE EXTRACTED FROM THE KHASRA REGISTER)

II

S. No.	Kh asra Nos.	Uncultivated		Cultivated			Irrigation		Remarks (location)
		Type	Extent	Season	Crops	Extent	Source	Extent	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1									
2									
3									

Total.....

Total.....

Total.....

Sown more
than once.....Irrg. more
than once.....Total area of the
Holding

Net Area sown....

Net Irrigated Area.....

III

	Details of Tenancy				Other Types	Total
	Owned	Rented (Cash)		Rented (Kind)		
		With occupancy rights	Leased	Share cropping		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Extent						

(TO BE FILLED IN BY INTERROGATION)

Principal Means of Livelihood	Subsidiary Means of Livelihood
(1)	(2)

V

Details of the Cultivator's Household

Dependents	ADULTS		Children	Total
	Male	Female		
(1)	(2)	(3)	(4)	(5)
Earners or other- wise helpers				
Others				
Total				

VI

Permanent Farm Servants	Number of scattered fragments

**DETAILS OF LIVESTOCK, POULTRY, AGRICULTURAL MACHINERY
AND IMPLEMENTS**

Males (Over 3 years)					Cows (Over 3 years)						
Description	Breeding Bulls	Bullocks for work	Others	Total	For Milk and Breeding				For Work	Others	Total
					In Milk	Dry	Not Calved	Total			
Cattle											
Buffaloes											

(Contd. below)

Description	Young Stock									Total			Total Bovine		
	Under 1 year			1 to 3 years			Young Stock								
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Cattle															
Buffaloes															

130 M. of Agri.

[illegible]

Description	Mules	Donkeys			Camels	Pigs	Total Livestock
		M	F	T			
Horses etc.							

[illegible]

M=Males; F=Females; T=Total

[illegible]

HOLDINGS ABSTRACT

Abstract Form V. F. 91

Year..... Due on.....

Details of agricultural holdings by systems of tenancy in the village of.....

Size : Classification	No. of holdings	Owned		Rented (Cash)								Rented (kind) Batai share croppers		Partly owned and partly rented		Others*		Total Area of holdings			
		No.	Area	Occupan- cy tenants		Lease holders		Others		Total		No.	Area	No.	Area	No.	Area	Owned	Rented	Others	— Total
				No.	Area	No.	Area	No.	Area	No.	Area										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Below—1 acre																					
1—2 5 acres																					
2.5—5 "																					
5—7.5 "																					
7.5—10 "																					
10—12.5 "																					
12.5—15 "																					
15—20 "																					
20—25 "																					
25 and above																					
Total																					

*Specify mortgages with cultivating possession and other types of tenancies in this column.

Signature

Date

ABSTRACT OF TENURES

Abstract Form
 V.F. 92
 Year.....
 Due on.....
 Details of land held under different systems of tenure in the village of.....

No. of Khewats	ZAMINDARY			RAIYATWARI			INAM			OTHERS			TOTAL AREA			TOTAL ASSES MENT
	No.	Area	Assess- ment	No.	Area	Assess- ment	No.	Area	Assess- ment	No.	Area	Assess- ment	Temp- orarily settled	Perma- nently settled	Total Area	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Signature.....

Date.....

ABSTRACT OF HOLDERS

Year..... Due on.....

Abstract Form

V. F. q3

Details of characteristics of cultivators and their dependents in the
village of

Size: Classification	Means of Livelihood						Working Dependents				Other Dependents			Farm Ser- vants
	Agriculture			Livestock			Adults		Children	Adults		Children		
	T	P	S	P	S	Male	Female							
1	2	3	4	5	6	7	8	9	10	11	12	13		
Below 1—Acre														
1—2.5—Acres														
2.5—5 "														
5—7.5 "														
and so on														
TOTAL														

T—Totally Dependent.

P—Principal means of livelihood.

S—Subsidiary " " "

Signature

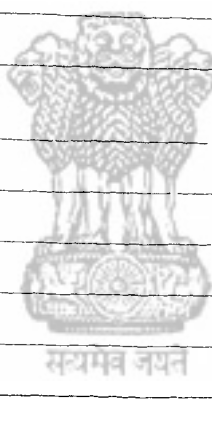
Date

ABSTRACT OF CROPS-HOLDINGWISE

Year Due on
 Number of holdings reporting area under crops in the village
 of

Abstract Form
 V. F. 94

Size: Classification	Cultivated Area										Sugar- cane													
	Irrigated		Unirri- gated		Total		Rice		Wheat				Jowar		Bajra		Maize		Barley		Ragi		Gram	
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Below—1 Acre																								
1—2.5 Acres																								
2.5—5 acres																								
5—7.5 acres																								
and so on																								
TOTAL																								



सत्यमेव जयते

(Contd.
below)

(Contd.
below)

Cotton		Jute		Groundnut		Linseed		Rape and Mustard		Sesamum		Castorseed		Coconut		Tobacco		Coffee		Tea	
No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

Signature

Date

ABSTRACT OF LIVESTOCK, POULTRY, AGRICULTURAL MACHINERY & IMPLEMENTS

Abstract Form
V. F. q5

Year.....Due on.....

Size : Classification	No. of holdings reporting	Males over 3 years	Etc. the same classification as in item VII of V. F: Q
(1)	(2)	(3)	(4)
Below 1 Acre	.	.	.
1-2.5 Acres	.	.	.
2.5-5 "	.	.	.
and so on .	.	.	.
Total .	.	.	.

Signature.....

Date.....

ABSTRACT OF SOURCES OF IRRIGATION

Abstract Form
V. F. 96

Year.....Due on.....
Details of sources of irrigation in the village of.....

C A N A L S				T u b e w e l l s		W E L L S					Reser- voirs	T A N K S		TOTAL
Government		Private		Government		Private		Total	Not in use					
No.	Mile- age	No.	Mile- age	Maso- nry	Non- maso- nry	Maso- nry	Non- maso- nry					With Ayaacut less than 100 acres	With Ayaacut more than 100 acres	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Signature.....

Date.....

PRIMARY FORECAST RETURN

Other Form

V. F.

(Periodical)

Year..... Luc on.....

Name of Crop.....

Details of cultivation in the village of.....

No. of Forecast	Due on	Total Area in the Current Year			Total Area in the Previous Year			Cause of increase or decrease	Details of area of current year@		Anna Valuation of the crop	* Remarks
		Pure	Mixed Net	Total	Pure	Mixed Net	Total		Irriga- ted	Unirriga- ted		
1	2	3	4	5	6	7	8	9	10	11	12	13
First												
Second												
Third												
Fourth												
Final												
Supplementary												

*REMARKS:

1. Were the Sowings early or normal or late ?
2. Did the harvesting commence in time ?
3. Specify gross areas under mixed crops separately in the final forecast, in the Remarks Column.

@ To be filled in for final forecasts only.

Signature

Date

APPENDIX II

DEFINITIONS OF ITEMS

Serial No.	Term	Definition	Remarks
1	2	3	4

1 Survey Number The survey number is the field or Khasra number given to the field in the village map.

(i) Each portion of land lying in one spot in the occupation of one person, or of several persons holding jointly, and held under one title should ordinarily be measured as a separate survey number; but large areas may be broken up into convenient fields.



(ii) A survey number may have part of its area cultivated and part uncultivated or part of one soil and part of another. It will ordinarily be convenient to measure waste separately and not to include irrigated with unirrigated cultivation as this leads to errors in totalling the village area. Survey numbers need not be multiplied on account of cultivation ridges or other temporary divisions.

(iii) Where there is a large area of undivided waste, it may be cut up into survey numbers corresponding with the limits of the survey squares.

2 Khewat Number The khewat number is the number of owner's holding.

Also called patta number, or jamabandi number.

3 Khatauni Number. The khatauni number is the number of the holding (khata) of the person responsible for the cultivation.

4 Tenure . . . The type of tenure denotes the relationship between the Government and the holder of the land.

e.g. Zamindari, raiyatwari, inam, etc.

5 Tenancy . . . The type of tenancy denotes the relationship between the holder of the land and the cultivator.

e.g. khud khist (cultivated by the owner himself), batai.

1

2

3

4

- | | | | |
|----|--|---|--|
| 6 | Cultivator's holding. | The cultivator's holding may be defined as all land that is used wholly or partly for agricultural production and is cultivated alone or with the assistance of others, without regard to ownership, size, or location. | It may consist of two or more parcels of land even if widely separated provided they form a part of the same operational unit. The holding should include all cultivated land irrespective of whether a particular crop is grown in that area or not. In case of lands held under joint tenancies where the respective shares of the members of such joint tenancy are not demarcated the whole joint holding may be taken as a single entity for the purpose of this enumeration. |
| 7 | Forests. | All actually forested areas on the lands classed or administered as forest under any legal enactment dealing with forests whether state owned or private. | If any portion of such land is not actually wooded but put to some agricultural use, that portion shall be included under the appropriate heading of cultivated or uncultivated land. |
| 8 | Barren and unculturable land. | All barren and unculturable land like mountains, deserts, etc. | Land which cannot be brought under cultivation unless at a high cost shall be classed as unculturable, whether such land is in isolated blocks, or within cultivated holdings. |
| 9 | Land put to non-agricultural use. | All lands occupied by buildings, roads and railways or under water <i>e.g.</i> rivers and canals and other lands put to uses other than agricultural. | |
| 10 | Culturable waste. | All lands available for cultivation, whether not taken up for cultivation or abandoned after five years for one reason or the other. | Such lands may be either fallow or covered with shrubs and jungles which are not put to any use. They may be assessed or unassessed and may lie in isolated blocks or within cultivated holdings. Land once cultivated but not cultivated for five years in succession shall also be included in this category, at the end of the five years. |
| 11 | Permanent pastures and other grazing lands. | All grazing lands, whether they are permanent pastures and meadows or not. | Village common and grazing lands within forested areas shall be included under this head. |
| 12 | Misc tree crops and groves not included in the net area sown | All cultivable land, which is not included under net area sown, but is put to some agricultural use. | Lands under Casurina trees, thatching grass, bamboo bushes and other groves for fuel, etc., which are not included under 'orchards' shall be classed under this category. |

1	2	3	4
13 Other fallow land.	All lands which were taken up for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five years.	The reasons for keeping such lands fallow may be one of the following : (1) poverty of the cultivators (2) inadequate supply of water, (3) malarial climate, (4) silting of canals and rivers, (5) unremunerative nature of farming etc.	
14 Current fallows.	Lands which are left fallow during the current year only.		
15 Net Area sown	The net area sown represents the area sown to crops, counting areas sown more than once in the same year only once.	This represents the difference between the total geographical area and the sum of areas under forests, barren and unculturable land, land put to non-agricultural uses, culturable waste, permanent pastures and other grazing lands, misc. tree crops and groves, not included in net area sown, other fallow land and current fallows.	
16 Cultivated area	The sum of net areas sown and area under current fallows gives the cultivated area.		
17 Gross cropped area.	Gross cropped area is the sum of areas under all crops and represents the sum of net sown area and area sown more than once in the year.		
18 Net irrigated area.	The net irrigated area represents the area irrigated from different sources, counting area irrigated more than once in the same year, only once.		
19 Area of crops irrigated.	The area of crops irrigated represents the gross irrigated area, being the sum of net irrigated area and area irrigated more than once in the same year.		
20 Normal yield.	The normal yield should be computed as a moving average of the average yields per acre obtained by the method of crop-cutting experiments based on the random sampling technique, wherever available, conducted during the preceding 10 years.		
21 Condition factor.	The condition factor denotes the condition of the crop in any season in terms of the normal crop.		
22 Harvest price.	The harvest price of a commodity may be defined as the average wholesale price at which the commodity is disposed of by the producer at the village site, during the specified harvest period.		

APPENDIX III

EXTRACTS FROM "PROGRAM FOR THE 1950 WORLD CENSUS OF AGRICULTURE

INTRODUCTION

Purpose of the 1950 World Census of Agriculture—

In the 1950 World Census of Agriculture it is intended that each government will obtain accurate and comparable information on its agriculture, including information on:

- (a) The number of agricultural holdings and their principal characteristics such as size, form of tenure, utilization of the area, utilization of labour, implements and mechanical power etc.,
- (b) The number and characteristics of the people who secure their livelihood from agriculture;
- (c) Areas under crops and numbers of livestock;
- (d) The volume of production of all important agricultural products.

Scope—

It is proposed that in every country the 1950 Census of Agriculture cover all types of agricultural holdings, including those whose products are consumed primarily by the holder and his family. It is recommended that tribal and other groups which are outside the normal marketing system be included.

Methods—

The 1950 World Census of Agriculture is in principle conceived of as a direct enumeration of individual holdings in each country, but it is anticipated that other means of obtaining the desired information may be preferable or necessary in some areas or countries.

Ideally, the census would include all agricultural holdings in a country, whether large or small. Practical considerations, however, make it necessary to limit the enumeration to those holdings which conform to certain recognized criteria and which fall above certain lower limits as to size of holding or size of operation or both.

No uniform minimum limits in respect to area or volume of output are suggested here, for these will vary from country to country. But in view of the large number of small holdings and their contribution in the production of some important foods, it is strongly urged that the minimum limits be made as low as possible.

In most countries the ideal method for carrying out such a census is through the employment of census agents, chosen for their intelligence, familiarity with local agricultural conditions, and skill in collecting statistical information. These census agents would need precise instructions and training in census procedures and in the manner of asking the questions and recording the replies. They should be responsible for obtaining the information relating to each holding in the districts assigned to them.

In some countries, experience has shown that other methods can be relied upon to provide satisfactory results; *e.g.*, area and land use might be obtained from land surveys and public records. In other countries primary reliance will need to be placed on the objective observations of the enumerators rather than on the reports from the agricultural holders. Wherever possible, objective verification of the data secured through reports from holders should be obtained. Some countries have found that verifying for a small sample of the holders the information obtained in the main enumeration is an essential aid to securing the most useful results.

For certain items (for example, production), estimates obtained by other methods may yield better results than direct individual enumeration of all holdings. Furthermore, in some areas where agricultural practices are primitive, a report from each individual producer may not be practicable, except perhaps for native cultivation fixed by long practice; hence estimates would have to be prepared for the entire community, tribe, village, etc. In such cases it is recommended that a report as similar as possible to that proposed for individual holdings be obtained for community, tribe, etc., by methods and means best suited to local circumstances and available facilities. In most underdeveloped areas some form of sampling will have to be used, the particular method to be chosen after adequate experiments and trials have been made in the territories where it is to be applied.

Attention is invited to the recommendations made regarding censuses in underdeveloped areas. For more information on this, *see* Report G/E/2(FAO), "Report on the census Program in Colonial and Underdeveloped Areas".

Although the volume of the production of agricultural commodities is of major concern to each country, this item is not included in either Part A or Part B of the list of recommended items. Some governments undoubtedly will wish to collect such data as a part of their censuses, while others will feel that estimates of production of individual crops can best be secured through means other than enumeration of individual holdings. For example, estimates of yield of crops may be secured through objective methods, such as the harvesting of small sample plots. Total production may then be estimated by applying the yield estimates to the acreage figures secured in the enumeration. In any case it is urged that estimates of production of crops and livestock products be prepared and transmitted to FAO as part of the census program.

FAO desires estimates of total production including that portion which is consumed on the holding where it is produced as well as that portion which enters into commerce.

Attention is called especially to the need for estimates of livestock and poultry products, in particular milk and eggs. For most of these commodities, seasonal variation in production makes it difficult to secure accurate information for a year's production through a general enumeration. Where appropriate methods are not already available, they will need to be developed in order to make such estimates. Because a large quantity of these products is consumed on the holdings on which they are produced, it is especially important that such estimates should not be confined only to that portion of the product which goes to market.

For a discussion of the relation of sampling to census procedures, see the reports of the Sub-Commission on Statistical Sampling of the Statistical Commission of the United Nations.

Whatever method or methods may be used, every effort should be made to give agricultural holders assurance that their census return will be used only for the purposes specified in the law authorizing the census. This is especially important in those countries in which the use of census returns for tax or regulatory purposes is prohibited by law.

Year and Period to which the Census Data Relates—

For purposes of international comparability, crop data gathered for the Northern Hemisphere should refer, as far as possible, to crops harvested in the calendar year 1949 and, in the case of some portions of the Far East, to harvests continuing into the early part of 1950; for the Southern Hemisphere, to crops harvested in the year from 1 July 1949 to 30 June 1950. When, for unavoidable reasons, it is necessary to collect data relating to another year, the chosen year should be as near as possible to the one that is proposed.

While most data called for relate to a particular crop or calendar year, such information as that relating to farm population and the number of livestock refers to a specified date. The date selected as the census date should be as near the time of actual enumeration as possible. Likewise, if a census week or a census month is designated, this should be as near the actual date of enumeration as possible.

Relation to a Census of Population—

Where the 1950 Census of Agriculture is to be conducted in close co-operation with a census of population, governments are urged to secure information on the agricultural population and labour force through the population census. They might also consider the possibility of collecting in connection with the population census some information regarding the incidental agricultural activities conducted on places that fall below the minimum size established in the definition of an agricultural holding by the Census of Agriculture. The details of the relationship between the two types of censuses will need to be developed according to the circumstances in each country.

Related Information to be Obtained—

Many governments have found that the information secured in a census of agriculture is much more useful if at the same time certain related information is collected.

Because of the close relationship of agriculture to forestry and fisheries it is suggested that, wherever possible, censuses or surveys of certain aspects of forest industries and fisheries be undertaken concurrently with the 1950 census of Agriculture in those countries where these are important enterprises. In some countries special attention may be given to the possibility of securing information concerning small saw-mills in connection with the Census of Agriculture.

The proposed program includes questions on the major land-use categories for all land in agricultural holdings. Most governments will find it useful to make estimates of the total land area of the country and of the major land-use categories for land *not* included in agricultural holdings such as:

- (1) Forest and woodland;
- (2) Extensive grasslands (prairie, savannah, steppe, veld);
- (3) Marshland or swampland (including muskeg, moors, etc);
- (4) Brushland, scrubland;
- (5) Deserts, sandy waste, bare rock, permanent snow fields;
- (6) Other land (including town sites, roads, railways etc.).

Publication of Results—

Governments are urged to publish the results of the 1950 Census of Agriculture as soon as possible after the enumeration has been completed. Many governments in the past have found it useful to publish preliminary results as soon as they become available, leaving the publication of the more detailed data and the geographic detail until later. Tabulation of sample of the questionnaires may make summary provisional totals available long before the detailed tabulation is completed. It is recommended that publications giving census results include specimens of the forms used, definitions of the pertinent items, and a description of the methods used in collecting and tabulating the data. Data secured by enumeration should be clearly distinguished from collateral estimates prepared as part of the census program.

Governments are requested to include in their own publications the information called for in the table outlines that are submitted with the recommended Census program. Governments are also requested to supply this information to FAO as soon as possible after the enumeration. As soon as such data become available, FAO proposes to publish a series of tables giving this information for all items for which comparable statistics can be secured.

Lists of Items to be included in the Census—

A uniform questionnaire to be used by all governments is not proposed. It is believed that the exact form of the questionnaire will vary from country to country in accordance with local conditions. The recommendations, therefore, are in the form of a list of the major items for which internationally comparable statistics are expected from the 1950 Census of Agriculture.

The list is in two parts. Part A includes those items about which data are desired from *all* countries. This part of the list has been limited to those items which are of major importance in the world's agriculture. It is understood that data on production of crops and livestock products are essential to supplement the information obtained in the enumeration itself.

Part B is more inclusive. In addition to all of the items in Part A, it contains items which are primarily of regional importance and items on which some countries may not be able to collect information at this time. It also provides for greater detail for some of the items in Part A. It is urged that when a country decides to include any or all of the types of information given in the list, it should endeavour to collect that information in terms of the recommendations given below.

Part A is not expected to meet the needs of any country fully. In developing their questionnaires some countries will wish to add items from Part B and some will wish to secure greater detail than is provided for in Part B or to add items not included in Part B. Each government will need to determine for itself what items and inquiries will best serve its particular needs. All are urged to include at least the items in Part A and to prepare their materials in such a way that the items correspond to the appropriate items in Part B or can be combined to provide the equivalent of the items included in Part B.

PART 'A'

*Proposed Census Items, Short List***I.—HOLDER AND TENURE**

1. Name of the holder.
2. Location of the holding.
3. Total area of holding or farm.
4. Amount of the total area owned by the holder.
5. Amount of the total area rented from others.
6. Amount of the total area operated by the holder under a different tenure from that covered in items 4 and 5.

II.—LAND UTILIZATION

- Amount of the total area of the holding in the following categories.
7. Arable land.
 8. Land for growing trees, vines, or shrubs.
 9. Permanent meadow and pasture.
 10. Wood or forest land.
 11. All other land.

*Number***III.—AGRICULTURAL POPULATION**

12. Members of the holder's household.

*Area***IV.—CROPS**

- 13-19 *Cereals Harvested for Grain*
13. Wheat.
14. Rye.
15. Rice.
16. Millet and Sorghum.
17. Maize.
18. Barley.
19. Oats.
20. Soyabeans.
21. Edible dry beans.
22. Edible dry peas.
23. Potatoes.
24. Sugar cane.
25. Sugar beets.
26. Cotton.
27. Groundnuts.
28. Tobacco.
29. All vegetables and melons for human consumption, grown in the open.

30-31 *All Grasses, Legumes, and Other Crops Cut for Hay.*

30. Rotation crops.
31. Permanent meadows.

*Productive Area***32-38 *Trees, Vines, and Shrubs***

32. Grapes.
33. Citrus fruits.
34. Coconut.
35. Bananas and plantains
36. Coffee
37. Tea.
38. Cacao.

V.—POWER

39. Was animal power used on this holding last year
Yes.....No.....
40. Was mechanical power used on this holding last year
Yes.....No.....

VI.—LIVESTOCK AND POULTRY**41-45 *Horses, Mules and Asses.***

41. Horses (Total).
42. Horses 3 years of age and over.
43. Colts and fillies under 3 years.
44. Mules (all ages).

46-49 *Cattle*

46. Cattle (Total).
47. Cattle 2 years of age and over
47(a) Male 47(b) Female.
48. Cattle under 2 years of age.
48(a) Male 48(b) Female.
49. Heifers in calf and cows.

50-53. *Buffaloes*

50. Buffaloes (Total).
51. Buffaloes 2 years of age and over
51 (a) Male 51 (b) Female.
52. Buffaloes under 2 years of age.
52 () Male 52 (b) Female.
53. Heifers in calf and cows.

54-57 *Sheep*

54. Sheep (Total).
55. Sheep 1 year of age and over
55(a) Male 55(b) Female.
56. Lambs under 1 year of age.
57. Goats (all ages).

58-61 *Pigs*

58. Pigs (Total).
59. Sows and gilts 6 month of age and over, for breeding.
60. Other pigs 6 months of age and over.
61. Pigs under 6 months of age.

62-65. *Poultry*

62. Hens, cocks, pullets and chicks (all ages).
63. Ducks and ducklings (all ages).
64. Geese and goslings (all ages).
65. Turkeys and poults (all ages).

PART 'B'

*Proposed Census Items, Expanded List***A. HOLDER AND TENURE**

- A-1. Name of the holder.
 A-1. Name in full of the Manager if the holding is not personally directed by the holder.
 A-2. Location of the holding.
 A-2. 1. Address of the holder also if he does not live on the holding.
 A-3. Total area of holding or farm.
 A-4. Amount of the total area owned by the holder.
 A-5. Amount of the total area rented by the holder from others.
 A-5. 1. Area rented on fixed cash basis.
 A-5. 2. Area rented for a share of the product.
 A-6. Amount of the total area operated by the holder under a form of tenure not covered by items 4 and 5.

B. LAND UTILIZATION

Amount of the total area of the holding in the following categories:

- B-1. Arable land (including land under specialized vegetable cultivation).
 (i) Irrigated.
 (ii) Not irrigated.
 B-1. 1. Area under specialized vegetable cultivation.
 (i) Irrigated.
 (ii) Not irrigated.
 B-1. 2. All other arable land
 (i) Irrigated.
 (ii) Not irrigated.
 B-2. Land for growing trees, vines and shrubs.
 (i) Irrigated.
 (ii) Not irrigated.
 B-3. Permanent meadow and pasture.
 (i) Irrigated.
 (ii) Not irrigated.
 B-4. Wood or forest land
 (i) Grazed.
 (ii) Not grazed.
 B-5. Productive marsh land, heath land and other productive but uncultivated land.
 B-6. All other land.

C. AGRICULTURAL POPULATION

- C-1. Members of the holder's household.
 C-2. Other persons living on the holding.

Years.

- C-3. Age of the holder.
 C-4. Number of days in the past 12 months spent by the holder on paid work not connected with the operation of the holding.
 C-4. 1. Days spent on paid work in agriculture on other holdings
 C-4. 2. Days spent on paid work in non-agricultural pursuits.
 C-5. Principal non-agricultural occupation (if any) of the holder.

D. EMPLOYMENT IN AGRICULTURAL WORK CONNECTED WITH THE HOLDING.

Number of persons engaged in agricultural work connected with the operation of the holding.

D-1. Number of Persons Employed During the Census Week.

D-1. 1. Holder and members of his family not receiving full wages in money.

(i) 15 years of age and over

Male

Female

(ii) 14 years of age and under

Male

Female

D-1. 2. Persons working for pay on the holding.

(i) 15 years of age and over

Male

Female

(ii) 14 years of age and under

Male

Female

D-2. Number of Persons Employed During the Census year.

D-2. 1. Holder and members of his family not receiving full wages in money.

(i) Men 15 years of age and over.

(ii) Women 15 years of age and over

(iii) Boys and girls 14 years of age and under.

D-2. 2. Persons working for pay on the holding at any time during the past 12 months.

(i) Employed 12 months (Total).

(a) Men 15 years of age and over.

(b) Women 15 years of age and over.

(c) Boys and girls 14 years of age and under.

(ii) Employed 6-11 months (Total)

(a) Men 15 years of age and over.

(b) Women 15 years of age and over.

(c) Boys and girls 14 years of age and under.

(iii) Employed 1-5 months (Total).

(a) Men 15 years of age and over.

(b) Women 15 years of age and over

(c) Boys and girls 14 years of age and under.

(iv) Employed less than 1 month (Total).

(a) Men 15 years of age and over.

(b) Women 15 years of age and over

(c) Boys and girls 14 years of age and under.

D-3. Amount of cash paid or to be paid for work done on the holding during the past year.

E. CROPS**ARABLE LAND****E-1. Cereals Harvested for Grain.****E-1. 1. Wheat (Total)**

(i) Irrigated.

(ii) Not irrigated.

- E-1. 1(a) Winter wheat.
 E-1. 1(b) Spring wheat.
 E-1. 2. Rye.
 E-1. 3. Rice (Total).
 (i) Irrigated.
 (ii) Not irrigated.
 E-1. 4. Millet and sorghum.
 E-1. 4.(a) Millet.
 E-1. 4.(b). Sorghum.
 E-1. 5. Maize.
 E-1. 6. Barley (Total).
 (i) Irrigated.
 (ii) Not irrigated.
 E-1. 7. Oats.
 E-1. 8. Spelt.
 E-1. 9. Maslin.
 E-1. 10. Other mixed grains.
 E-1. 11. Other cereals harvested for grain.
 E-2. *Leguminous Plants for Grain.*
 E-2. 1. So beans
 E-2. 2. All dry beans and peas
 E-2. 2(a) Edible dry beans
 E-2. 2(b) Lentils
 E-2. 2(c) Chick peas
 E-2. 2(d) Edible dry peas
 E-2. 2(e) Other legumes for grain
 E-3. *Tuber and Root Crops for Food or Feed*
 E-3. 1. Potatoes
 E-3. 2. Manioc
 E-3. 3. Arrowroot
 E-3. 4. Sweet Potatoes
 E-3. 5. Tuber and root crops grown principally for food
 E-4. *Grasses, Legumes, and Grains for Hay, Pasture, Green Fodder and Silage*
 E-4. 1. Grasses, Legumes and grains cut for hay (Total).
 E-4. 1(a). Alfalfa (lucerne, Clover, Other leguminous Crops, Grasses, legumes and grains grown only for pasture, green feed or silage (Total). Alfalfa, clover and other leguminous plants, Grasses, Maize and sorghum grown especially for silage,
 E-5. *Other Fodder Crops Not Included Elsewhere.*
 Cabbage for fodder, pumpkins for fodder, other crops.
 E-6. *Vegetables and Melons Grown in the Open.*
 All vegetables and melons principally for human consumption,
 Grown as field crops,
 Grown in market gardens,
 Grown in kitchen gardens.
 Leafy green or yellow vegetables for human consumption.
 Artichokes,
 Asparagus,
 Beans (fresh),
 Cabbage,
 Carrots,
 Kale,
 Lettuce,
 Peas (green),
 Pumpkins and squash,
 Spinach,
 Chicory for greens,
 Other leafy green or yellow vegetables.
 Melons and cucumbers
 Watermelons, cantaloupes, and other melon crops, Cucumbers.
 Other vegetables for human consumption
 Beets (red)
 Cauliflower,
 Celery,
 Corn (sweet),
 Eggplant,
 Garlic,
 Onion,
 Radishes,
 Rutabagas,
 Tomatoes,
 Turnips,
 All other vegetables.
 E-7. *Cultivation under Glass*
 Glasshouses and frames.
 E-8. *Flowers and Bulbs Grown in the Open*
 Flowers, Bulbs.
 E-9. *Crops Grown for Seed*
 Sugar-beet seeds, Vegetable seed, Maize Hybrids and parent strains, other crops for seed not reported elsewhere.
 E-10. *Crops for Industrial Purposes*
 Sugar crops
 Sugar cane (Total)
 (i) Irrigated.
 (ii) Not irrigated.
 Sugar beets, other sugar crops.
 Fibre crops
 Cotton (Total)
 (i) Irrigated
 (ii) Not irrigated
 Flax harvested for fibre, Hemp harvested for fibre, New Zealand flax, Abaca, Jute and Jute-like fibres, Ramie and Rhea, Sisal and henequen, Other fibre crops.
 Oilseed crops
 Groundnuts, Linseed, Hempseed, Castor beans, Rapeseed or Colza, Sesame, Sunflower, Other oilseed crops not reported elsewhere.
 Spices, condiments, and aromatic plants.
 Aniseed, Cardamom, Mustard, Pimento or peppers, Poppy seed, Other cultivated spices, condiments and aromatic plants.
 Essential oil plants
 Citronella, Geranium, Lemon grass, Lavender, Other cultivated essential oil plants, Other industrial crops, Tobacco, Hops, indigo, Other crops for industrial purposes not included elsewhere.
 E-11. *Crop Land Not Sown or Not Harvested*
 Fallow land, Land not sown or planted and lying idle, but under rotation and normally ploughed. Crop failure, destruction, or loss, Sown land from which no crop was harvested in the census year because of crop failure or destruction from any cause.

PERMANENT MEADOWS AND PASTURE

E-12. Area Cut for Hay

Total

TREES, VINES AND SHRUBS

E-13. Grapes

Grapes (Total)

(i) Irrigated.

(ii) Not irrigated

For wine, For table use, For raisins.

E-14. Olives

Olives (Total), For oil production, For direct consumption, fresh or preserved.

E-15. Trees, Bushes, and Vines Yielding Spices, Condiments and Aromatic Products.

Cinnamon, Cloves, Clumin seed, Nutmeg and mace, Black pepper, Other cultivated trees, bushes and vines yielding spices, condiments and aromatic products.

E-16. Fruits Trees

Citrus trees (Total)

Oranges, Mandarins and tangerines, Lemons, Grape-fruit, Other citrus trees.

Other planted or cultivated fruit trees (Total)

Apples, Apricots, Avocades, Cherries, Dates, Figs, Mangoes, Peaches, Pears, Plums and Prunes, Other Planted or cultivated non-citrus fruit trees.

E-17. Cultivated Edible Nut Trees

Almonds, Chestnuts, Filberts, Walnuts. All other edible nut trees.

E-18. Small Fruits Cultivated.

Strawberries, Raspberries, Other small fruits and berries.

E-19. Other cultivated Fruits.

Bananas and Plantains, Pineapples, Others.

E-20. Miscellaneous Cultivated Trees, Shrubs and Vines.

Coffee, Tea, Cotonut, Oil palms, Kola nut, Kapok, Cinchona, Mulberry.

Rubber, gum and resin plants (Total)

Rubber, Ule, India rubber, Guayule, Gutta percha, Other rubber, gum and resin trees and shrubs, Other cultivated trees, shrubs and vines not included under the previous headings.

E-21. Nurseries

Nurseries of fruit and nut trees, vines and olive trees, Nurseries of ornamental trees and bushes, Nurseries of forest trees, Other nurseries.

(For miscellaneous native products from uncultivated sources, obtained by the holders outside of their holdings, it is suggested that the interested governments select a list of the items of greatest importance as food or other products and report estimates of them).

F. LIVESTOCK AND POULTRY.

F-1. Horses, Mules and Asses

Horses (Total), Horses 3 years of age and over, Mares and stallions for breeding purposes, Other horses, Horses 1 year of age but under 3 years, Colts and fillies under 1 year of age, Mules (Total), Mules 3 years of age and over, Mules under 3 years of age, Asses (Total).

F-2. Cattle

Cattle (Total), Cattle 2 years of age and over, Male, Female, Young stock 1 year of age and under 2 years, Male, Female, Calves under 1 year of age, Heifers in calf and cows, Kept primarily for milk, Kept for other purposes.

F-3. Buffaloes

Buffaloes (Total), Buffaloes 2 years of age and over, Male, Female, Buffaloes 1 year of age and under 2 years—Male, Female, Buffaloes under 1 year of age, Heifers in calf and cows, kept primarily for milk, Kept for other purposes.

F-4. Sheep

Sheep (Total), Males 1 year of age and over, Females 1 year of age and over, (i) Kept primarily for milk, (ii) Kept for other purposes. Lambs under 1 year of age, Sheep clipped during the census year, Total production of wool.

F-5. Goats

Goats (Total), Males 1 year of age and over, Females 1 year of age and over (i) Kept primarily for milk, (ii) Kept for other purposes, Kids under 1 year of age, Goats clipped during the census year, Total production of mohair.

F-6. Pigs

Pigs (Total), Pigs 6 months of age and over (i) Sows and gilts for breeding, (ii) Other pigs, Pigs under 6 months of age

F-7. Poultry

Chickens (Total), Cocks, Capons, hens and pullets 6 months of age and over, Cockerels, pullets and chicks under 6 months of age, Ducks (Total), Ducks 6 months of age and over, Ducks and ducklings under 6 months of age, Geese (Total), Geese 6 months of age and over, Geese and Gaslings under 6 months of age, Turkeys (Total), Turkeys 6 months of age and over, Turkeys and poult under 6 months of age, Guinea fowl (Total), Guinea fowl 6 months of age and over, Guinea fowl under 6 months of age.

F-8. Rabbits

Total number of rabbits and hares kept in captivity.

F-9. Bees

Number of hives or colonies, Total amount of honey obtained from them.

F-10. Fur-bearing Animals

Fur-bearing animals (Total), Foxes, Skunks, Mink, Others.

F-11. Domesticated Animals Peculiar to certain Countries.

Camels (Total), Camels 4 years old and over, Camels under 4 years of age, Llamas, guanacos, and vicunas (Total), Zebras (Total), Reindeer (Total), Elephants (Total).

F-12. Silkworms

Silkworm eggs placed in incubation, Fresh cocoons produced.

G. AGRICULTURAL TECHNOLOGY

G-1. Was animal power used on the holding last year ?

Yes _____ No _____

G-2. Was mechanical power used on the holding last year ?

Yes _____ No _____

G-3. If animal or mechanical power was used, check which of the following were used on the holding last year :

G-3(a). Horses, mules or asses,

G-3(b). Oxen,

G-3(c). Cows,

G-3(d). Other animals,

G-3(e). Tractors,

G-3(f). Other self-propelled machines,

G-3(g). Electric motor, (h) Water power,

G-3(i). Windmill,

G-3(j). Stationary engine,

G-3(k). Other motors.

G-4. Is electricity used for lighting on the holding ?

Yes _____ No _____

G-5. Is electricity used for other purposes on the holding ?

Yes _____ No _____

G-6. Is there an electric distribution line within 400 meters ($\frac{1}{4}$ mile) of the holding ?

Yes _____ No _____

G-7. Distance to nearest all-weather rail.

G-8. Number of tractors now on the holding.

G-9. Was a reaper or a reaper and binder used on the holding last year ?

Yes _____ No _____

If so, check whether it was :

(a) Self-propelled _____

(b) Drawn _____

G-10. Number of reapers or reapers and binders now on the holding.

(a) Self-propelled

(b) Drawn

G-11. Was a harvester-thresher used on the holding last year ?

Yes _____ No _____

If so, check whether it was:

(a) Self-propelled

(b) Drawn

G-12. Number of harvester-threshers now on the holdings.

(a) Self-propelled.

(b) Drawn.

G-13. Was a thresher used on the holding last year ?

Yes _____ No _____

G-14. Number of trucks (motor lorries) now on the holdings.

G-15. Number of automobiles now on the holding.

H. FERTILIZERS AND SOIL DRESSINGS

H-1. Total area to which organic or chemical fertilizers were applied.

H-1 (a). Area to which animal manure was applied,

H-1(b). Area to which green manure was applied,

H-1 (c). Area to which chemical fertilizers were applied,

H-1(d). Area to which other fertilizers were applied.

H-2. Total area to which lime and other soil dressings were applied.

I. IRRIGATION AND DRAINAGE

I-1. Area of land irrigated.

I-2. Area of land drained.

I-2(a). Area drained by pumping

(i) Open drains

(ii) Covered drains.

I-2(b). Area drained by gravity flow through covered drains.

J. FRAGMENTATION

J-1. Is all the holding in one piece of land ?

Yes _____ No _____

J-2. If not, how many non-contiguous parcels of land are included in the holding ?

K. WOOD AND FISHERY PRODUCTS

K-1. Wood Products Cut on the Holding

K-1(a). Firewood,

K-1(b). Fence posts,

K-1(c). Saw logs,

K-1(d). Pulpwood,

K-1(e). Pitprops,

K-1(f). Railway ties or sleepers,

K-1(g). Other wood products

K-2. Aquatic Products.

K2 (a). Quantity of fish taken from the waters of the holding during the census year.

K-2 (b). Quantity sold.

K-2(c). Types and quantities of other aquatic products taken from the waters of the holding during the census year.

K-2(d). Quantities sold.

PART 'C'

EXPLANATORY NOTES AND DEFINITIONS

Definition of a Holding or Farm—

A holding or farm, for census purposes, is all land that is used wholly or partly for agricultural production * and is operated, directed, or managed by one person, alone or with the assistance of others, without regard to title, size or location. It may consist of two or more parcels of land, even if widely separated, provided that they form a part of the same technical and economic unit.

The holding or farm may be known as a lot, piece, or parcel of land, garden, orchard, estate, ranch, plantation, rural establishment, proprietorship, communal establishment, or by some other name, but in any case it must be operated, directed, or managed by one civil or juridical person. Where the holding or farm is operated jointly by two or more related or associated persons, they are to be considered as constituting one person for the purpose of the census.

Where several farm units share the same technical or economic services (as on plantations, collective farms, areas operated by communities, and similar establishments) the area in each unit should be considered as a separate farm or holding if a distinct area of land is assigned to the individual farm operator and such operator shares in the agricultural products of such land, or if a specified group of livestock or poultry is assigned to the individual farm operator and such operator shares in the livestock or poultry products. However, when individuals, labourers, etc., on farms or plantations comprising several farm units or holdings are not assigned a distinct area of land or group of animals and do not receive a share of the agricultural products derived therefrom, then the entire group is to be considered as a single farm or holding. Plots of land used for the growing of vegetables and the keeping of livestock and poultry for use by agricultural workers and members of their family on a holding are to be regarded as part of the holding on which such workers are employed.

When two or more establishments are under the same ownership and general direction, but the immediate management and supervising are done by different persons, they are preferably to be classified as separate holdings.

Enterprises not including any cultivated land but producing livestock or livestock products (piggeries, hatcheries, poultry batteries, city dairies, rabbitries, apiaries, etc.) are to be considered as farms or holdings whether they are located in rural or urban areas. Enterprises engaged in the production of only forest products, fish, frogs, dogs, or wild game are not to be considered as farms.

Agricultural Population—

Promotion of the welfare of rural people is one of the major objectives of FAO. Accordingly it is necessary to secure information about the people who live in rural areas and particularly about those people who

* Growing of field crops, fruits, nuts, seeds, tree nurseries, bulbs, vegetables and flowers both in the open and under glass, and the production of livestock and livestock products, poultry and poultry products, honey, rabbits, fur-bearing animals, etc.

secure their livelihood from Agriculture. The proposed definition of the agricultural population (all persons living on agricultural holdings plus those holders and their households who reside elsewhere) is not the most desirable definition for all countries, but it appears to be the most practical definition for use in a census of agriculture. In most countries the majority of agricultural workers live on the holdings or in the households of the holders. If the number of these workers and of their dependents is known, it may be possible, with the aid of other information, to estimate the total number of persons actually dependent upon agriculture. For more detailed discussion see the United Nations report "Problems of Defining, Identifying and Measuring the Agricultural Population". (*Studies of Census Methods*, No. 3).

Because of the wide diversity of conditions in different countries in the world, it does not seem feasible to list in detail the items of information desired about people who work in agriculture and their dependents, but it is urged that all governments obtain as much information as possible. A census of population can provide more data on this segment of the population than are proposed in the program for the census of Agriculture. Many countries will also be taking a census of population in or about 1950 and the results of the two censuses together could provide considerable information, about the agricultural population. In this connection, the attention of the governments is drawn to the United Nations report, "Collation of Results of Population and Agricultural Censuses" (*Studies of Census Methods*, No. 1).

Area

The area to be reported under each crop should be carefully defined. If the census is taken after the crop has been harvested, the "area harvested" ordinarily is the area to be reported. But if the census is taken during the growing season, the area will most likely be either "area sown" or "area under crops at the census date." Unless the area reported is clearly defined, the conclusions drawn from the application of yield estimates to area may be erroneous.

Crops

Associated or mixed crops.—Different crops can be cultivated simultaneously on a piece of land in such a way that it is difficult to ascertain which part of the total area is to be ascribed to each crop. It is possible to find:

- (a) Lands occupied by trees, vines, or shrubs, where the distance between the plants is large enough to permit the sowing of some crops in the intermediate land or the utilization of permanent grasses growing on this land;
- (b) Arable land or permanent meadow or pasture also containing a certain number of trees, vines, or shrubs;
- (c) Crops sown between or in the rows where a row crop is already sown at approximately normal planting distance,
- (d) Mixed plantings, including different kinds of trees, vines, or shrubs.

When land described under (a) and (b) is classified according to utilization, parts of the total area approximating the area covered by herbaceous crops and by trees, vines, or shrubs should be reported as "arable land" or "permanent meadow and pasture" and as "land for growing trees, vines or shrubs" respectively. If the arable crops or permanent

grasses and the trees, vines, or shrubs are so intermingled that the areas which belong to either cannot be distinguished, the whole of the area should be classified according to the principal crop. When such combinations are common, it may be desirable to distinguish between "arable land with trees" and "arable land without trees," and between permanent meadow and pasture with trees and that without trees. Correspondingly, the land used for growing trees, vines, and shrubs might be classified as to whether or not it also includes arable crops or permanent meadow and pasture.

As regards the interplanted crops indicated under (c) or mixed crops indicated under (d), the area occupied by each crop should be given separately wherever it can be determined. If a distinction is not readily possible, an estimate should be made; the amount of land attributed to each crop should be entered as an estimate.

Areas sown more than once in the year.—When two or more crops are grown and harvested successively, but in the same agricultural year, on the same land (as, for instance, in the case of beans following after wheat) the area of such land should be entered opposite the first crop and included in the total for the related category. The same area should also be entered for the other crops, with an appropriate indication. In such cases, as well as in the case where two harvests of the same crop are taken on the same land in the same year, it is essential that the information be secured in such a way that the total area reported for a crop is correctly shown, and that the duplication can be eliminated from the total land area of the holding.

Crops yielding more than one product.—Where the same crop yields more than one product, as in the case of hemp, flax, or cotton (fibre and seed), and data on production are collected through the census for the different products obtained, the area should be given under the principal product and repeated under the secondary product, but in such a way that there is no risk of duplication in the totals.

Animal and Mechanical Power

One of the very important measures of the level of living of agricultural people is the extent to which cultivation of the soil and other agricultural work are dependent upon human power alone. For this reason it is proposed that every government include in its census of agriculture simple questions on whether any animal or mechanical power was used in doing the farm work. It is not necessary to ascertain, for this purpose, whether or not the holder owns draft animals or engines or motors, but rather whether he had them available for his own use. It is recognised that many governments will desire to obtain additional information on this subject.

Livestock numbers

It is proposed that the census include all livestock on each holding, whether or not they belong to the holder, plus any animals owned by the holder which are temporarily away from the holding at the time of the enumeration but not on other agricultural holdings (includes livestock grazing on common pasture, unenclosed prairies, or on uncultivated land not included in any agricultural holdings).

APPENDIX I

PROPOSED TABLES

The tables attached are submitted as a minimum set of tables for which comparable data are desired from all countries taking part in the 1950 World Census of Agriculture.

The results of the census could be presented according to a number of different bases of classification. Many countries will not wish to use only one such basis, but will use several in order to present the data in a form most useful in the light of their own needs. For purposes of international comparison and presentation, however, it seems best to limit the number of proposed classification schemes and also the amount of cross tabulation.

The classification bases which have been most generally utilized in previous censuses are the following:

- (a) Classification by size of holdings. For example, area of permanent meadow and pasture, or area under wheat; or number of cows respectively on holdings of less than 1 hectare, on holdings of 1 hectare and less than 5 hectares, etc.
- (b) Classification according to the amount of land in the holding which is classified as arable land, agricultural land, etc.

The classification most frequently used is that based on the size of the holding, and this is the major basis of classification proposed here.

Each country is at liberty to choose the size groups that appear most suitable to its particular circumstances, but it is recommended that the size groups used should be such as to permit their rearrangement according to a common classification. The size groups proposed are:

Under 1 hectare
1 ha. and under 5
5 ha. and under 10
10 ha. and under 20
20 ha. and under 50
50 ha. and under 100
100 ha. and under 200
200 ha. and under 500
500 ha. and under 1,000
1,000 ha. and under 2,500
2,500 ha. and over.

Countries which do not use the metric system are urged, as far as possible, to arrange their classification in such a way as to enable approximate comparison with the size groups given above. For example, in the countries which use the acre as their unit of area, the following scale would be considered satisfactory for international comparison:

Under 2.5 acres
2.5 acres and under 5
5 acres and under 10

10 acres and under 25
 25 acres and under 50
 50 acres and under 100
 100 acres and under 250
 250 acres and under 500
 500 acres and under 1,000
 1,000 acres and under 2,500
 2,500 acres and under 5,000.
 5,000 acres and over.

Some countries will find it desirable to have additional tabulations for holdings of less than 1 hectare, and they may wish to divide these small holdings into a number of size groups. This should be done whenever possible, for much can be learned about the structure of a country's agriculture from a careful study of the smaller units. However, in many cases the definitions under which holdings of less than 1 hectare are included or excluded from the enumeration will vary so widely that international comparability for holdings in this size group is not readily possible. In these tables, therefore, particular emphasis is given to the holdings of 1 hectare and over.

Although FAO is principally interested in obtaining national figures, the availability of details by geographical and administrative sub-divisions will contribute to a more adequate understanding of the agricultural conditions in each country. It is impossible to make recommendations on the minimum size of the territory or area for which details would be desirable from an international point of view, since the needs and the practices in respect to this question vary widely in different parts of the world.

In publishing results of their previous censuses, many countries have indicated for most items the number of holdings from which the figures were supplied. This practice is strongly recommended to all countries. A better understanding of the agricultural structure of a country is possible if, for example, not only the total area of permanent meadow and pasture or the total area under rice is known, but also the number of holdings that have such areas and the number of holdings that engage in other agricultural enterprises.

TABLE 1.—*Number and Area of HOLDINGS, by Size of Holding*

Country..... Date of Census.....

Size classification	Holdings		Area	
	Number	Percentage distribution	Hectares	Percentage distribution
1	2	3	4	5

TABLE 2.—Number and Area of Holdings, by Tenure and Size of Holding

Country..... Date of Census.....

Size classification	Total holdings reporting		Holdings operated under one tenure form							
			Owned by the holder		Rented from others		Operated under other forms of tenure		Holdings operated under mixed forms of tenure	
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area

TABLE 3.—Total Area in Holdings, by Tenure and Size of Holding

Country..... Date of Census.....

Size classification	Total Area	Area owned by the holder	Area rented from others	Area operated under other tenure forms

TABLE 4.—Number of Persons in Holders' Households, by Size of Holding

Country..... Date of Census.....

Size classification	Number of holdings reporting	Number of persons reported

TABLE 5.—*Utilization of Land in Holdings, by Size of Holding*

Country.....

Date of Census.....

Size classification	Total land	Arable land	Land for growing trees, vines or shrubs	Permanent meadow and pasture	Wood or forest land	All other land

TABLE 6.—*Area of Principal Crops, by Size of Holding*

Country.....

Date of Census.....

Indicate which of the following areas is used in this table :

Area harvested.....Area sown.....Other (specify).....

Wheat		Rye		Rice etc.		
Number of holdings	Hectares reported	Number of holdings reporting	Hectares reported	Number of holdings reported	Hectares reported	and so on

TABLE 7.—*Production of Principal Crops*

Country.....

Crop year.....

Crop	Unit of measure	Number of Units

TABLE 8.—*Number of Horses, Mules and Asses, by Size of Holding*

Country.....

Date of Census.....

Size classification	Horses				and so on
	Number of holdings reporting horses	Total number of horses reported	Number reported 3 years of age & over	Number reported under 3 years of age	

TABLE 9.—*Number of Cattle, by Size of Holding*
Date of Census

Size classification	Total Cattle (all ages)			Heifers in calf and cows	
	Number of holdings reported	Number of head	Number of cattle 2 years of age & over	Number of cattle under 2 years	Number of head reported

TABLE 10.—*Number of Sheep and Goats, by Size of Holdings*
Date of Census

Size classification	Sheep			Goats	
	Number of holdings reporting sheep	Total number reported	Number of males 1 year of age and over	Number of females 1 year of age & over	Number of holdings reporting goats
				Number of lambs under 1 year of age	Number of goats reported

TABLE 11.—*Number of Pigs, by Size of Holding*
Date of Census

Size classification	Total			Date of Census	
	Number of holdings reporting	Number of head reported	Sows and gilts 6 months of age and over for breeding	Other pigs 6 months of age and over	Pigs under 6 months of age

TABLE 12. -- *Number of Poultry, by Size of Holding*

Country.....	Number of holdings reporting poultry	Number of heads reported			
		Chickens	Ducks	Geese	Turkeys
Size classification					

TABLE 13. -- *Use of Power on Agricultural Holdings' by Size of Holding*

Country.....	Some animal power used		Some mechanical power used		Animal and mechanical power used		Neither animal nor mechanical power used	
	Number of holdings reporting	Percentage	Number of holdings reporting	Percentage	Number of holdings reporting	Percentage	Number of holdings reporting	Percentage
Size classification								

TABLE 14. -- *Area of Arable Land, by Size of Holding*

Country.....	Total number of holdings reporting	Area of Arable land reported				& so on
		Under 1 ha.	1 ha. and under 5	5 ha. and under 10	10 ha. and under 20	20 ha. and under 50
Size classification						

TABLE 15.—Number of Holdings Reporting Specified Number of Cattle, by Size of Holding

Size classification	Country		Date of Census				
	Total number of holdings reporting	Number of holdings reporting 0	Number of holdings reporting 1	Number of holdings reporting 2-5	Number of holdings reporting 6-10	Number of holdings reporting 11-20	& so on



TABLE 16.—Number of Holdings Reporting Specified Rice Area, by Size of Holding

Size classification	Country		Date of Census			
	Total number of holdings reporting	Area reported in rice				& so on
		None	Less than 1 ha.	1 ha. and under 5	5 ha. and under 10	

APPENDIX IV

DETAILED TABLE SHOWING THE AVAILABILITY OF AGRICULTURAL STATISTICS
IN INDIA

(In million acres)

Name of Province or State	Total Geog- raphical Area accor- ding to Cen- sus Bulletin *	Reporting Area †			Total	Area known to be surveyed in the non- reporting Areas
		Surveyed‡	Unsurve- yed	Based on field to mate Estimated		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>I. Temporarily settled provinces</i>						
(i) Assam .	32.2	7.6	..	25.9	33.5	..
(ii) Bombay A } B }	70.5	41.6 9.1	.. ..	7.1 ..	48.7 9.1	.. ..
(iii) U. P. .	68.0	58.3	..	9.3	67.6	..
(iv) East A } Punjab B }	24.0	19.0 0.2	.. ..	4.0 ..	23.0 0.2	.. ..
(v) C.P. & A } Berar B }	83.4	47.3 ..	.. ..	15.8 ..	63.1 ..	20.3 ..
(vi) Madras A } B }	81.8	54.9 0.9	.. ..	25.0\$..	79.9 0.9	.. ..
(vii) Ajmer-Merwara	1.5	1.6	..	..	1.6	..
(viii) Coorg .	1.0	1.0	..	..	1.0	..
(ix) Delhi .	0.4	0.4	..	..	0.4	..
Sub Total A } B }	362.8	231.7 10.2	.. ..	87.1 ..	318.8 10.2	.. 20.3
TOTAL .	362.8	241.9	..	87.1	329.0	20.3*
<i>II. Permanently settled provinces</i>						
(i) West Bengal .	18.0	..	18.2	0.6	18.8	..
(ii) Bihar . A } B }	45.0	.. ..	43.5 ..	0.8 ..	44.3 ..	.. ..
(iii) Orissa . A } B }	38.3	.. ..	11.1 ..	9.0 ..	20.1 ..	.. 18.2
Sub Total A } B }	101.3	.. ..	72.8 ..	10.4 ..	83.2 ..	.. 18.2
TOTAL .	101.3	..	72.8	10.4	83.2	18.2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
III. Indian States							
(a) Merged States included in I & II.	..	10.2	..	—	10.2	38.5	
(b) Unions of States:							
(i) Himachal Pradesh	6.7	1.9	—	—	1.9	..	
(ii) PEPSU	6.5	6.5	—	..	6.5	..	
(iii) Saurashtra	16.2	1.4	—	—	1.4	10.6	
(iv) Rajasthan	82.2	20.7	—	—	20.7	..	
(v) Madhya Bharat	29.9	19.5	—	—	19.5	..	
(vi) Vindhya Pradesh	15.7	1.6	—	—	1.6	..	
(vii) Travancore and Cochin	5.9	0.8	4.7	..	5.3	..	
Sub Total	163.1	52.2	4.7	..	56.9	10.6	
(c) Major States:							
(i) Hyderabad	52.7	47.9	..	5.0	52.9	..	
(ii) Kashmir	52.6	8.0	..	..	8.0	..	
(iii) Mysore	18.7	17.4	..	—	17.4	..	
(iv) Bhopal	4.5	4.4	..	..	4.4	..	
Sub Total	128.5	77.7	..	5.0	82.7	..	
(d) Other Areas:							
(i) Andamans and Nicobar Islands	2.0	..	—	—	..	..	
(ii) Cutch	5.4	..	—	—	—	...	
(iii) Bilaspur	0.3	0.3	..	..	0.3	..	
(iv) U.P. States||	4.0	3.9	—	—	3.9	..	
(v) Assam States¶	11.4	0.8	..	—	0.8	..	
(vi) Sikkim	1.8	..	..	—	..	..	
Sub Total	24.9	5.0	..	..	5.0	..	
Total Indian States	..	145.1	4.7	5.0	154.8	49.1	
GRAND TOTAL	780.6	376.8	77.5	102.5	556.8	49.1	

* Census of India, Paper No. 2, 1949.

† According to "Agricultural Statistics of India".

‡ Cadastrally surveyed i.e. for which field maps exist.

§ Of which 14.0 million acres is in Zamindari and Inam villages.

|| Includes Rampur, Banaras and Tehri Garhwal.

¶ Includes Cooch Behar and Tripura.

A Excluding merged States.

B Merged States.

APPENDIX V

CURRENT METHODS OF ESTIMATING AREA UNDER MIXED CROPS

East Punjab.—In certain districts of the province the mixed crops are shown separately by the patwari according to his estimate, by first measuring the area under mixed crops by Kadmi paimaish and then estimating the ratio in which it has been sown. In other districts the area under mixed crops such as wheat-gram, barley-gram, is entered under the separate columns for the different crop mixtures provided in the Jins-war and *Lab-Kitabi*. Mixed crops are distributed by office kanungos under appropriate headings of single crops. The area of cotton and oilseeds which are sown mixed with other crops is estimated according to the rule locally followed in preparation of crop abstracts. In case of wheat and gram however the area under each of these crops when sown in mixture is taken as half and half of the total area.

Travancore.—The area covered by such mixed crops is recorded by eye estimates.

Himachal Pradesh Union.—The area under mixed crops is recorded separately for each crop.

Coorg.—In case of mixed crops inter-sown with ragi such as Tur dal etc. the area of the plot under each crop is assessed on the basis of the extent sown. In case of Kumri cultivation, the mixed crops are rice, tur dal and vegetables and the area is assessed at about $\frac{1}{3}$ of the area sown under each. In other mixed crops where the constituent crops are sown in rows, they are estimated on the basis of the proportion of the number of rows under each.

Assam.—Half the area of the field is shown under each of the crops (*Vide* rule 65 ASSAM LAND RECORDS MANUAL).

Orissa.—The net area under each crop is estimated on the field itself and recorded separately under each crop.

Mysore.—The area under mixed crops is being based on eye estimates.

C. P. and Berar.—The mixture is shown under the predominant crop if no separate heading is prescribed in jinswar (C. P.) for such a mixture. In Berar, the areas under components of a mixed crop are allocated and shown separately in the crop statement. The crop is described by writing the names of all component crops together with the name of the predominant crop first. Generally separate columns are provided for important mixtures.

Madras.—If two or more crops are sown in rows, the area occupied by each is estimated by the Karanam in the ratio of number of rows. In other cases they are usually estimated and are based on guesses by the Karanams.

Jaipur.—Mixed crops are shown separately under different heads.

Patiala.—The procedure followed in the PEPSU is the same as that in East Punjab.

U. P.—In U. P. the important mixtures such as wheat and barley are entered in the village registers as "mixtures", no attempt being made by the village officers themselves to separate the areas of component crops. The sub-division of area is done in the Central Offices on formulae supplied to them. An appropriate formula for each crop has been prepared for

every district or homogeneous portion of the district, in consultation with the District Officer. For unimportant mixtures, that is, for mixed crops with no separate heading, the minor constituent is ignored and the whole area is to be credited to the principal crop. In the case of mixed oilseeds, which are not recorded separately, the area and yield are therefore arrived at as follows:

Area under mixed linseed = $\frac{1}{2}$ of the total acreage under gram plus $\frac{1}{6}$ of the total acreage of wheat and barley and their mixtures.

Yield of linseed per acre sown mixed with gram = $1\frac{1}{2}$ maunds.

Yield of linseed per acre sown mixed with a crop other than gram = $\frac{1}{2}$ maund.

APPENDIX VI

CURRENT METHODS OF ESTIMATING AREA UNDER UNCULTIVATED PATCHES

East Punjab.—In case of patches in a cultivated field, they are measured separately at the time of settlement. The settlement staff measure such areas by paces (Kadmi Paimaish) and indicate them separately in the record of rights. The patwari during the course of Girdawari indicates such areas separately from the cultivated area and if the area of such patches is later reduced and converted to cultivated area, the patwari makes the entry accordingly at the time of next Girdawari in the manner indicated above i.e. by Kadmi paimaish. Similar action is taken by the patwari if the area of such patches is increased.

Travancore.—The area covered by uncultivated patches in a cultivated field is estimated by the eye.

Himachal Pradesh Union.—Uncultivated patches in a cultivated field are estimated roughly by Kadmi paimaish.

Coorg.—All patches like swampy surfaces which cannot be brought under cultivation are included in the waste area. This is done by eye estimation.

Assam.—Area under patches is recorded by eye estimation.

Orissa.—Area under patches is roughly measured with the help of standard poles and their area noted.

Mysore.—Patches in a cultivated field are not being estimated.

C. P. and Berar.—The patches in a cultivated field are estimated by actual inspection on the spot and by eye appraisalment.

Madras.—Actual measurements of patches or parts of fields are made only when water rate is charged. The area is only estimated in all cases where no government revenue is involved. In certain districts, part field cultivation is roughly measured by means of strides, spaces or off-set poles.

Jaipur.—There is no such problem in Jaipur.

Patiala.—The procedure followed in the PEPSU is the same as that in East Punjab.

APPENDIX VII

CURRENT METHODS OF ESTIMATING AREA UNDER BUNDS

East Punjab.—Ordinary bunds showing the boundaries of the cultivated field are treated as cultivated area but when there is a substantial area under a bund, then this area is shown separately as *Ghair Mumkin Bund* or *Ghair Mumkin Bana* in the Khasra Girdawari. Such area is calculated by pace measurement.

Travancore.—The area covered by such bunds is recorded by eye estimates.

Himachal Pradesh Union.—Area under bunds is shown as culturable waste.

Coorg.—The whole area of the field will be surveyed and the area of bund recorded only by eye estimation. The area under bunds is not included in the cropped area.

Assam.—Area under bunds is not separately recorded.

Orissa.—The area covered by bunds is included in the cropped area during the estimation.

Mysore.—The area under bunds (permanent or temporary) is not recorded actually at present. But according to rules, a margin of 3 feet for dry land and $\frac{1}{2}$ foot for wet lands is to be left by the cultivator between two survey numbers.

C. P. and Berar.—In the C. P., bunds are included in the reported area under crop while in Berar, the area under the field bunds is excluded from the area under the crops. The area common to two adjoining fields is apportioned generally in the ratio of half and half.

Jaipur.—There is no such problem in Jaipur.

Patiala.—The procedure followed in the PEPSU is the same as that in East Punjab.

U. P.—The area covered by field ridges is included in the area of field as entered in the Patwari Khasra; which is ultimately reported to the Director of Land Records.

APPENDIX VIII

SPECIMEN FORM FOR THE PROVINCIAL FORECAST RETURN

(Final) Forecast Report on (Crop) for the year

PROVINCE/STATE.....

District or Division	AREA						YIELD							Remarks				
	Of current year's crop	Of previous year's crop	Average of preceding crop	Percentage by which col. 2 exceeds or is less than			Percentage of area irrigated in the current year	Of current year's crop	Of previous year's crop	Average of pre-ceeding			Percentage by which col. 10 exceeds or is less than	Condition factor	Harvest price			
				Col. 3	Col. 4	Col. 5				3 yrs.	5 yrs.	Col. 11	Col. 12	Col. 13				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Due date fixed by the Central Government.....

Date on which this return is despatched.

Reasons for delay, if any.

Signature

APPENDIX IX

SPECIMEN FORM FOR THE REPORTING OF HARVEST PRICES

Village Tehsil
 Circle District
 Price prevailing on.....195 .

Commodity	Quality	Wholesale price per Imperial Maund of 82 2/7 lbs.			Remarks
		Rs.	As.	Ps.	

Signature

Date

APPENDIX X

SPECIMEN FORM FOR REPORTING WAGES OF AGRICULTURAL
LABOUR

*Statement showing the Current Rate of Agricultural Wages during the Fort-
night ending.*

Village
 Name of patwari..... District.....
 (In rupees, annas and pies per normal working day of.....Hours.)

TYPE OF LABOUR	Wage Rate		
	Cash wages	Value of wages in kind	Total
I. Field labourers			
(a) Men			
(b) Women			
(c) Children			
II. Herdsmen			
(a) Men			
(b) Women			
(c) Children			
III. Other Agricultural Labourers			
(a) Men			
(b) Women			
(c) Children			

Signature
 Date

APPENDIX XI

DETAILED BREAK UP OF THE EXPENDITURE ON THE AGRICULTURAL CENSUS

A. REPORTING AREAS—		Rupees
(i) Remuneration of Patwaris . . .	6250×15	93,750
(ii) Cost of supervisory staff (4 months) $250 \times 150 \times 4$		1,50,000
(iii) Headquarters staff (one year)—		
1 Commissioner . . .	$1 \times 1500 \times 12 = 18,000$	
4 Statisticians . . .	$4 \times 300 \times 12 = 14,400$	
2 Superintendents . . .	$2 \times 250 \times 12 = 6,000$	
5 Assistants . . .	$5 \times 175 \times 12 = 10,500$	
20 Clerks . . .	$20 \times 100 \times 12 = 24,000$	
		<u>72,900</u>
(iv) Contingencies, etc.		60,000
		<u>3,76,650</u>
		or 3·8 lakhs
and 15 units :		<u>57 lakhs</u>

B. NON-REPORTING AREAS—

Primary Agency		
(i) Surveyed :	50 millions acres	
	@ Rs. 60,000 per 1·5 million acres . . .	20 lakhs
(ii) Unsurveyed	175 million acres . . .	
	@ Rs. 180,000 per 1·5 million acres . . .	210 lakhs
(iii) Headquarters staff, contingencies etc. $2 \cdot 0 \times 5$ for 5 units.		10 lakhs
		<u>240 lakhs</u>

C. CENTRAL STAFF (2 Years)—

Commissioner . . .	$1 \times 2000 \times 24 = 48,000$	
Deputy . . .	$1 \times 1000 \times 24 = 24,000$	
4 Officers . . .	$4 \times 500 \times 24 = 48,000$	
8 Assistants . . .	$8 \times 250 \times 24 = 48,000$	
24 Computers & clerks . . .	$24 \times 150 \times 24 = 86,400$	
		<u>2,54,400</u>
T. A.		30,000
Contingencies		60,000
		<u>3,44,400</u>

	Rs. Lakhs.
A. Reporting Areas	57
B. Non-reporting Areas	240
C. Central Staff	3·4

Rupees 3 Crores round.

APPENDIX XII

COPY OF LETTER OF APPOINTMENT OF THE COMMITTEE

Copy of the letter No. F. 12-7/48-St dated the 6th April, 1949 from S. Basu, Esquire, I.C.S., Joint Secretary to the Government of India, Ministry of Agriculture, New Delhi, to All Provincial Governments, Local Administrations and Indian States and Unions of States.

SUB:—*Appointment of a Technical Committee to Work out details of Enquiries in connection with the Food and Agriculture Organisation, Census of Agriculture.*

I am directed to say that in pursuance of the recommendations of the Provincial/State Ministers' Conference held in September, 1948, the Government of India have constituted a Committee consisting of the following persons:—

1. Mr. W. R. Natu, Economic and Statistical Adviser and Deputy Secretary, Ministry of Agriculture. (Chairman)
2. Professor P. C. Mahalanobis, F.R.S., Statistical Adviser, Cabinet Secretariat, New Delhi.
3. Dr. P. V. Sukhatme, Ph.D., D.Sc., (London), Statistical Adviser, Indian Council of Agricultural Research, New Delhi.
4. Dr. V. G. Panse, Deputy Director (Research), Institute of Plant Industry, Indore.
5. Dr. B. Natarajan, Economic Adviser to the Government of Madras, Madras.
6. Mr. G. M. Sankpal, Director, Bureau of Economics and Statistics, Government of Bombay, Bombay.
7. Mr. K. Kishen, Statistician to the Department of Agriculture, United Provinces, Lucknow.
8. Mr. N. C. Chakravarty, Assistant Secretary, Department of Agriculture, Forests and Fisheries, Government of West Bengal, Calcutta.
9. Mr. H. C. Kothari, Statistical Officer, Government of Jaipur, Jaipur.
10. Mr. K. S. Sursinhji, Director of Agriculture, Government of Saurashtra, Rajkot.
11. Mr. B. A. Bambawale, I.C.S., Secretary to the Government of Central Provinces and Berar, Land Records Department, C. P., Nagpur.
12. Mr. J. S. Sarma, Research Officer, Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi. (Secretary)

2. The Committee will have the following terms of reference:

- (a) to examine the forms of returns at present used by the different provinces and states for routine collection of data and evolve standard forms of returns.
- (b) to consider whether any special modifications are necessary in the scope of enquiry in respect of areas where the system of land survey or record of rights is not introduced; and
- (c) to explore the directions in which the data collected through the Census of Agriculture can be usefully integrated with the data collected through the Census of Population.

3. The pay, T. A., D. A., etc., of the members of the Committee will be drawn from their respective Governments.

4. I am to request that the Committee may kindly be afforded all necessary facilities in their work by the Provincial/State Governments who may kindly ask their officers concerned to co-operate fully in the work to be carried out by the Committee.

